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FOOD MANUFACTURE

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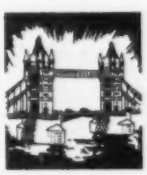

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FOOD MANUFACTURE

Vol. XXV, No. 12 December 1, 1950

Mr. Webb's Red Herring

MR. WEBB'S flying start as Minister of Food has come to an abrupt stop. Recently he was obliged to tell the Guild of Agricultural Journalists that difficulties in obtaining supplies of food from overseas were increasing. His role as a de-rationer would seem to have ended. Instead of sprinting into public favour he must now jog steadily along, justifying the continuance of remaining rationing systems, explaining perhaps why some of the food rations must be reduced, and gaining any credit he can for avoiding the re-imposition of discarded rationing. The troubles of his predecessors have caught up with Mr. Webb.

This is not surprising. In these columns attention has been frequently drawn to the fundamental and underlying facts of the world food situation. Time and again it has been stressed that Britain, with a population of 50 million and an ability to produce at most only 50 per cent. of the national diet, is acutely exposed to the dangers inherent in the world food supply position. With demand and production in such a precarious state of balance, any sudden change in world economics or world politics—such as the Korean crisis or widespread inflationary tendencies—must have a large and adverse effect upon food supplies. No Minister of Food, however confident and however efficient, can evade these recurrent problems.

However, Mr. Webb hardly encouraged a sympathetic understanding of his difficulties when, at the same conference, he criticised the Press for not paying enough attention to the needs of the consumer and for paying too much to the interests of producers. He suggested that he had been accused on more than one occasion of failing to help the consumer when the only evidence for this had come from the trade at a time "when he was fighting the trade on behalf of the consumer." It is difficult to regard this as anything more than a politician's red herring, and not a very good one of its kind at that.

Every producer of food, whether by direct growing or by further processing of food materials, knows that in the long run the consumer's verdict is decisive. If Mr. Webb had the farmers in mind when he spoke of fighting "the trade" on behalf of the consumer, he could hardly have chosen a more inappropriate time than the late autumn of 1950 when so much financial loss had been associated with the harvest. If he had the food manufacturing industry in mind, the suggestion that it has to be fought in the consumers' interests is nonsensical, for what the purchaser thinks about any processed foodstuff determines its success or failure as a commercial article.

Competition has been ruling the market of the shop counter for many months, a fact that Mr. Webb tacitly noted when he swept away the points system. We cannot help feeling that Mr. Webb's red herring about the Press was out of season.

State Sugar?

The newly declared intention of the Government to nationalise the British Sugar Corporation has already been regarded as a strategic retreat from bigger ideas involving the whole sugar industry. However, the decision follows one of the oldest principles in the theory of nationalisation, namely that any large industry which constantly requires large-sized subsidies might as well be taken over by the State. This argument was powerfully used when the coal mines and railways were nationalised.

In the July, 1950, issue of FOOD MANUFACTURE, we discussed the history of the beet sugar subsidies at some length. The considerable reduction of the annual subsidy in the Civil Estimates for 1950/51—from £4 to £¾ million—seemed paradoxical then. It surely seems even more paradoxical now, for it would be easier to justify nationalisation if the taxpayer were still heavily financing the conversion of beet into sugar. Now the subsidy is lower than it has ever been in its twenty-five years' history.

Or is there a more subtle explanation? Will it prove less costly to take over the British Sugar Corporation if its last year of partially independent trading has £3¾ million less in receipts from subsidies? If a longer view is taken, the nationalisation dogmatists may regret that the subsidy was ever reduced; for substantial subsidy payments in the past are useful alibis for large annual losses after nationalisation. Certainly one debate in the current Parliamentary session is likely to have a sweet atmosphere.

British Packaging—Grave Situation

That three well-attended meetings have been held to "cross-examine" specialists as to the reasons why British packaging techniques and practices are far behind those of America is grim to contemplate. To have recourse to excuses is always lamentable, but those given at the open meetings of the Institute of Packaging, when the specialist team on packaging which visited the U.S.A. under the auspices of the Anglo-American Council on Productivity answered questions, were certainly convincing and alarming.

According to the adage, comparison is odious, but when it directs a spotlight on a particular problem as did these meetings, which were supplementary to the findings published in the recent Report of the team, it is clear that the British packaging industry is not to blame. There appear to be two main factors which are militating against British packaging: one is lack of supplies of the actual materials used; the other, and more important one, is the poor quality of those materials which are available. A subsidiary trouble is the lack of various types of packaging machinery. In respect of this last point, it is urged that dollars be freed for the purpose of acquiring such machinery, but this would be useless without supplies of good class materials to warrant it.

At the last of the three meetings, held in London, Mr. G. M. Ashwell, leader of the team, said that if British packages were to be brought up to the level of the average American product, so as to enable competition with other peoples' products in dollar markets, the whole situation required urgent attention at the highest levels of Government. He felt the Prime Minister should realise that the situation was so grave that unless it was tackled, British packaging would soon be back at the lowest levels touched during 1939-1945.

Outsize Department

Most of us have natural and healthy instincts about sizes and shapes—we feel that it is best to be fairly normal, that there is bound to be weakness in extreme variations of bigness or littleness. But other forms of life and growth, forms that we utilise as food, are being "sized up"—an increasing number of reports reveals that yet another Wellsian fantasy is beginning to turn into reality. It is not some remarkable "Food of the Gods" that produces giant shapes—it is all a matter of chromosomes, the science of the plant and animal breeder rather than the science of nutrition.

It has recently been reported that rabbits weighing 12 pounds each have been bred in Sweden from parent rabbits of the normal 5½ pounds weight. It is said that these "triploid" rabbits are the result of several years of secret research. Even the best of conjurers could not produce this sized rabbit from a hat. Australian farmers will at least be grateful that no one has thought of this before.

In the United States genetical research workers are appealing to members of the public to send them any exceptionally large fruits found in natural growth. The "sport" or double-sized apple and the "king" grape are to be used as the investigation material for long-term work on chromosome effects. New plant breeding experiments will apparently be based upon these natural examples of size abnormality. Yet we should recoil at once from plans to breed numerous outsized humans from our own occasional cases of freaklike giantdom; we look upon chromosome irregularities as unhealthy and fortunately rare.

Is the deliberate and scientific development of freak-sized rabbits or fruit any more desirable, any more likely to lead to healthy species? Or is it reasonable to think that the world's variety of shapes and sizes is well enough arranged without interference; that, for example, instead of bigger rabbits Nature has provided hares?

Tanganyika and Queensland

The new Report and Accounts from the Overseas Food Corporation for 1949/50 should not be regarded as one more dismal instalment of the groundnut story. It is true that neither the crops nor the balance sheets are satisfactory; little has materialised from early hopes or even later plans; any chance of improvement in 1949 was dashed by the severe droughts.

There are clear signs that the whole project is being re-assessed. Its original and over-ambitious size has been severely reduced; even on the land already cleared reductions in the amount of arable farming are likely. These contractions will make it impossible for the revised project to produce a profit reasonably related to the vast amount of capital already expended, but the scale of annual loss may be reduced in time. In brief, those concerned with the scheme are learning the ancient lesson of walking before running.

Groundnuts in East Africa are not the only concern of the Corporation. The fifth section of the Report deals with the Queensland-British Food Corporation's progress, and this far happier story should not be swamped by the groundnut gloom. The Queensland venture, despite set-backs from abnormal weather during 1949, is more than fulfilling its initial promise. Large acreages of sorghum and sunflower have been sown and cropped, some 15,000 head of cattle purchased, and one complete piggery established. Since the scheme is only in its second year, this is commendable progress. The conclusion

drawn in the Report, that "the Corporation's prospects may be regarded as bright," cannot be disputed.

Nevertheless, direct comparisons of the two overseas food production schemes should not be hastily made. In one case a large-scale agricultural project has been taken to an area without the background of an already well-developed agriculture; in the other, existing and successful agricultural practice has been extended. It would be grossly unfair not to allow for this major difference. The Queensland project is one of development and extension; the groundnut scheme in Africa is still one of agricultural exploration.

Phytic Acid and Rickets

Some years ago Mellanby demonstrated that rickets in dogs was due not only to the lack of fat-soluble vitamin in their diet, but also to the presence of harmful factors. Bruce and Callow (*Biochem. J.*, 1934, **28,** 517) found that the absorption of calcium from the intestines was inhibited by phytic acid, and Harrison and Mellanby (*Biochem. J.*, 1939, **33,** 1660) described work which demonstrated that phytic acid could account for the rachitogenic properties of cereals fed to dogs.

Additional light on the anti-calcifying properties of phytic acid has been thrown by Mellanby (*J. Physiol.*, 1949, **109,** 488), and a useful abstract of this work is given in the *British Medical Journal* (No. 4685, 1950). Comparisons of the rachitogenic actions of phytate with those of corresponding amounts of inorganic phosphorus have given divergent results in different experiments, and the cause of the variation has been traced to irregularities in the vitamin D reserves of the animals at the commencement of the experiment.

When reserves of vitamin could be called on it was invariably found that phosphorus in the form of phytate caused more severe rickets than the same amount as inorganic phosphate, but in the absence of reserves the difference was largely obscured. Moreover, even with high doses of vitamin D phytate still reduced the amount of calcium absorbed from the intestines, with the result that bones were less well calcified and more osteoporotic than when it was absent from the diet or was replaced by inorganic phosphate.

A diet high in phytate must, therefore, be supplemented with both calcium and vitamin D if bone formation is to be perfect. Some evidence was obtained that vitamin D may destroy phytate and, conversely, phytate appeared to increase the rate of expenditure of the vitamin D reserves. The main anti-calcifying action of phytate, however, presumably depends on its competition in the intestines with its structural analogue, inorganic phosphorus, for combination with calcium.

Subtilin on Trial

Although several reports have been released from the Bureau of Agriculture and Industrial Chemistry of the U.S. Department of Agriculture contending that subtilin is a sterilising agent for food preservation, it would be unwise to place too much trust in the claims made for this antibiotic.

We tend to favour the warning issued by Dr. E. J. Cameron, director of the Washington Laboratory of the National Canners' Association, that facts regarding the efficacy and safety of any new food preservation method should be conclusively and scientifically established before public announcements are issued.

If it were effective to the degree claimed, then the use of subtilin would make it economically possible to preserve certain canned products without subjecting them to high temperature sterilisation. Tests carried out by the National Canners' Association do not justify any such claim.

These views are also subscribed to by Dr. K. F. Meyer of the University of California, a world authority on food poisoning, who has registered a strong protest that a serious health hazard is involved in the use of subtilin, and he called upon the Bureau of Food and Drug Inspection of the California State Department of Public Health to issue a warning to that effect. This the Board did to those canners who operate under State inspection.

Experiments carried out by the National Canners' Association in which subtilin was used in accordance with the treatment prescribed by U.S.D.A., and in one instance in which the antibiotic was added in an amount four times greater than that indicated in the releases, showed conclusively that subtilin could not at the moment be relied upon for safe preservation.

Some experiments made in a Buenos Aires laboratory (published in this issue) confirm these findings, but the marked inhibitive or retarding effect of subtilin and other substances on the growth of micro-organisms warrants further investigation.

More American Synthetics

Nothing opens the door to modern synthetics more than variabilities of supply or quality and rising prices. These factors are well exemplified in two new synthetic food products recently reported in the United States. One of these is the spearmint flavour of chewing gum.

Natural spearmint oil, which contains about 65 per cent. of carvone, has been fluctuating in supply and quality for some years, and research was therefore directed towards synthesising carvone from other and more readily available materials.

Not only has this now been achieved by the Southern Research Institute in Alabama, but the synthesis has been based upon prolific wastes of the citrus fruit canning industry, the peels of oranges

and grapefruit. It is expected that synthetic carvone will soon take the place of natural spearmint oil in the production of chewing gum and similar food products; it may, however, be used as a partial supplement rather than as a complete replacement.

The second synthetic, the principal stimulant for which appears to have been the sharply rising post-war price, has a much wider significance for the food industry. The substance is tartaric acid, long derived as a natural by-product of the European wine industry, particularly that of France. A process for making tartaric acid from coal tar has been developed at Columbia University and, according to reports made to the American Chemical Society at a recent meeting in Chicago, the costs of the chemical method of production will not be higher than those for the somewhat laborious method followed for extracting natural tartaric acid from wine residues.

So far as can be judged from an early and brief account, the details of the coal-tar process are quite simple. Maleic anhydride is obtained from coal-tar benzol; oxidation with hydrogen peroxide, using tungsten oxide as a catalyst, gives pure tartaric acid which can be crystallised out.

This second development will probably be welcomed in Europe with some misgivings as it may enable the United States to achieve self-sufficiency for yet another customary import from non-dollar areas. Modern synthetic chemistry can widen the dollar gap just as much as it can narrow it!

Gastronomic Controversy

In these baffling times, when wars and rumours of war abound; when it would appear to many that the fate of *homo sapiens* is balanced perilously on a sharp knife edge; when international friendships are fragile and changing things, a little comic relief produces a lessening of the tension which is felt by all and sundry. Such relief is perhaps increased by the fact that the very providers of the same are not aware of its comicality.

Large shipments of British kippers have crossed the Atlantic and the consignees—the Americans—want to know how to cook them!

People of praiseworthy perception have realised that here is a matter not to be treated lightly, for is not the kipper an important instrument in the cementing of Anglo-American relationships, not to mention a valuable dollar-earner that may be classed with tweeds, woollens, and whisky?

A few men and women, who can be relied upon not to act hastily or without cautious judgment, have considered the matter serious enough to warrant a letter to *The Times*. But alas! at such a time when there should have been unity in these islands, Britain has presented a divided front. Threatened attacks on her shores have always bound her children closer together, but the laws for cooking kippers have divided them.

"The *only* way to cook a kipper is to immerse it in boiling water for thirty seconds, then immediately transfer it to the frying pan containing hot fat, and fry to golden brown," says one writer. "Not so," says the believer in simple unadulterated food. "Pour a lot of boiling water over them in a dish and let them stand for a minute or two."

The chairman of the Herring Industry Board, on being pressed for his advice, diplomatically said that every kipper connoisseur had his own method; he himself placed his kipper in a casserole with some butter, and then put it in the oven for a quarter of an hour or so.

But it appears that all the passionate feeling aroused by this crisis is to be of no avail; it is extremely doubtful whether the recipes and hints that have been proffered by those sincerely concerned about the ultimate fate of the kipper will be taken to heart. American correspondents entertained recently with all the pomp and ceremony befitting such an occasion as the launching of the kipper drive took the matter into their own hands, and, with typical *sang-froid* and utter irreverence, they ate their kippers with bread and jam!

The Sausage—Past and Present

As if in celebration of the 250th anniversary of the Oxford Sausage, the Minister of Food has permitted a Grade A sausage. At a maximum price of 1s. 10½d. a pound and with a total meat content of 65 per cent. (but only 52 per cent. of it pork), the newcomer, already named after the Minister himself, makes us thankful for small mercies, now that high-priced turkeys but little more meat are promised as Christmas fare. Pork has been the main constituent desired in everyday sausage, as distinct from fancy varieties and such brothers as haggis and black pudding, ever since the Romans used it with chopped pine-nuts, bay leaves, and other seasonings. Even the Roman haggis came from pork and raw eggs with a little "putrified fish guts" as background.

Five hundred years ago the "weasel" was popular, and here again pork, eggs, and seasoning were the specification. Other periods brought other varieties; pork was displaced only when variation from the popular model was sought. With sheep substituted for pig, with cereal introduced as if in anticipation of modern "fillings," the Scots showed one way. German sausage with lambs' lights stuffed within a sheep's gut; the Bologna with beef and veal as well as pork; and American hot dogs with bull meat—these are samples of many. Mr. Webb's 52 per cent. pork will do to be going on with.

Streamlined Breakfast Food Production

Mr. W. H. White, managing director of Quaker Oats Ltd.

Since November 22, 1899, when Quaker Oats Limited was registered as a company, its business has grown and expanded until, in 1936, a new seven-story mill was opened at Southall to meet the greatly increased demand for breakfast cereals. In the same year the agricultural side of the company's business had received fresh impetus by the opening of a feed mill at Preston and the new Southall mill was also equipped with the most up-to-date plant to produce animal feedingstuffs.

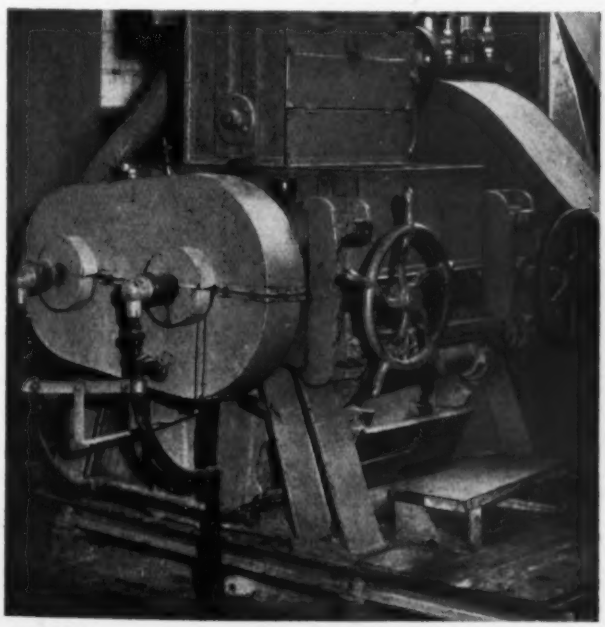
Barges bring the grain to the Southall mill.

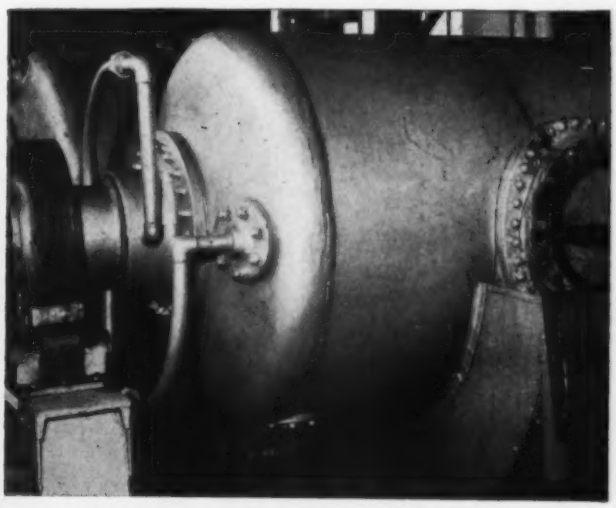
IN 1943, under the guidance of Mr. W. H. White, formerly manager in Western Canada and now managing director of the company, plans were laid for the manufacture of Quaker Oats at Southall, and today all products sold in Great Britain, consisting of Quick Quaker Oats, Quaker Puffed Wheat, Quaker Sugar-Roasted Corn Flakes, Quaker Quick Macaroni, and a full line of poultry and pig feedingstuffs, are made at Southall.

Grain, brought by barges to the Southall mill from the London Docks by way of a branch of the Grand Union Canal, is unloaded by means of suction elevators into the building for storage.

Quick Quaker Oats

Part of the milling for the production of Quick Quaker Oats is carried out at Southall, and the remainder at the Quaker Whitehaven Mill, which was taken over by the company from John Pattinson and Son on December 1, 1949. Forming one of the largest blocks of factory buildings in Cumberland, the Whitehaven mills are capable of a very great output of oat products.

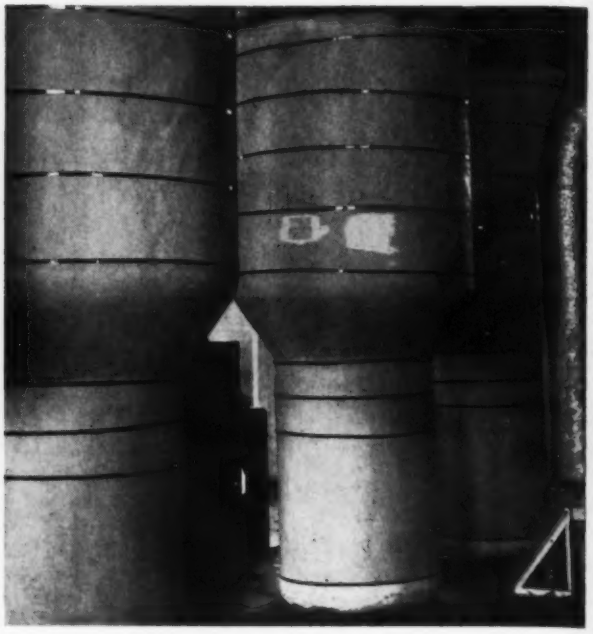




Above: **Rotary cooker used in the manufacture of corn flakes.**

Left: **Heavy duty rolls for the production of corn flakes.**

Toasting ovens with flakes emerging on to the conveyor.



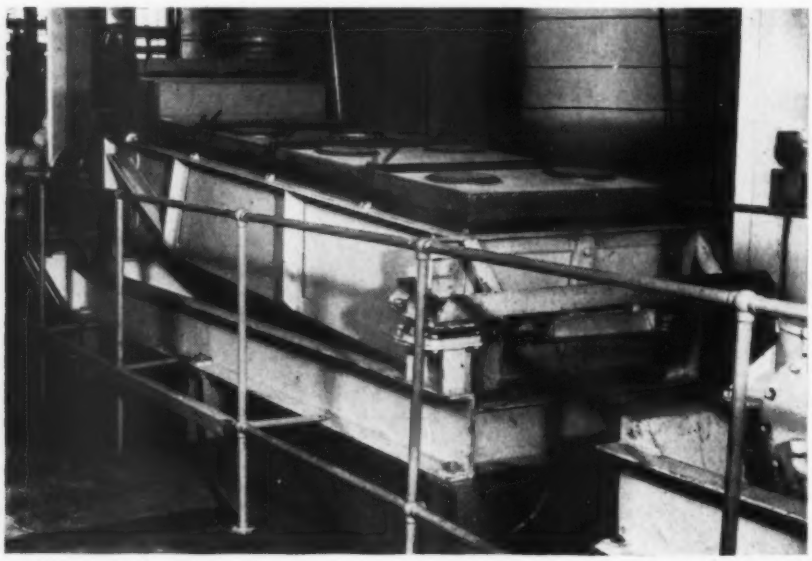
Some of the wheat storage tanks.

After milling, the groats pass through a battery of cutters which cuts them into approximately three pieces, the rejected uncut groats being returned to the cutter later so that no waste ensues. The cut groats are then cleaned and heat-treated by means of steam.

Flaking and Packing

The final step in the manufacturing operation is the flaking process, which is effected by feeding the steamed groats between rolls. The finished product is then fed to the filling machines.

Quaker Oats are packed in dust-proof containers by means of two packing machines, one for small and one for large packs. The cartons used are automatically made in the factory from large reels of cardboard. After filling, the cartons are then sealed and printed wrapping labels are automatically pasted round the pack, which is finally passed by conveyor for hand packing into the large containers. These are fed by roller conveyor and chute to the despatch bay after they have passed through the automatic case sealing machines.



Rotary grader for wheat.

Corn Flakes

The maize used in the manufacture of Quaker Sugar-Roasted Corn Flakes is first passed through a grader and washer for the elimination of extraneous matter. Following these preliminary operations, the maize is then passed through a de-germinator, which skins off the husk, removes the germ, and breaks up the endosperm. Further cleaning and grading operations are carried out on the endosperm, known as maize grits, and these are then weighed into rotary pressure cookers together with flavouring materials (sugar, salt, etc.) for cooking in live steam.

The cooked, flavoured grits are then dried and conveyed to water-cooled rolls from which they emerge as flakes. From the rolls, the flakes pass to the floor below for toasting in the rotary gas-fired ovens. Toasted flakes are ejected from the ovens on to a conveyor belt and, after cooling and grading, they pass to the packaging department on a lower floor.

The units operating on the packaging of the flakes seal the

One of the puffing guns for the production of puffed wheat.

Part of the battery of oat cutters with steaming pipe on the right.

bottoms of the cartons, insert waxed bags, weigh the flakes, and finally seal the cartons.

Operatives then pack the sealed cartons into outer cases, which pass through the automatic case sealing machine and thence by conveyor and chute to the despatch bay on the ground floor.

Puffed Wheat

Before processing, the wheat used in the manufacture of Quaker Puffed Wheat is cleaned and graded. The dressed and prepared wheat is then transferred to storage tanks, which are situated directly above the puffing guns on the floor below.

Explosions from the guns vibrate through this floor in rapid succession as the wheat goes through this particular process. Predetermined amounts of wheat are fed into the stainless steel barrels of the guns where it is steamed and heated to considerable pressures and temperatures, the whole process being automatically controlled.

After a given period of time, the "gun" is "fired" and the wheat is exploded out into a receiving cage and taken by conveyors situated below the cages to the grading machines.

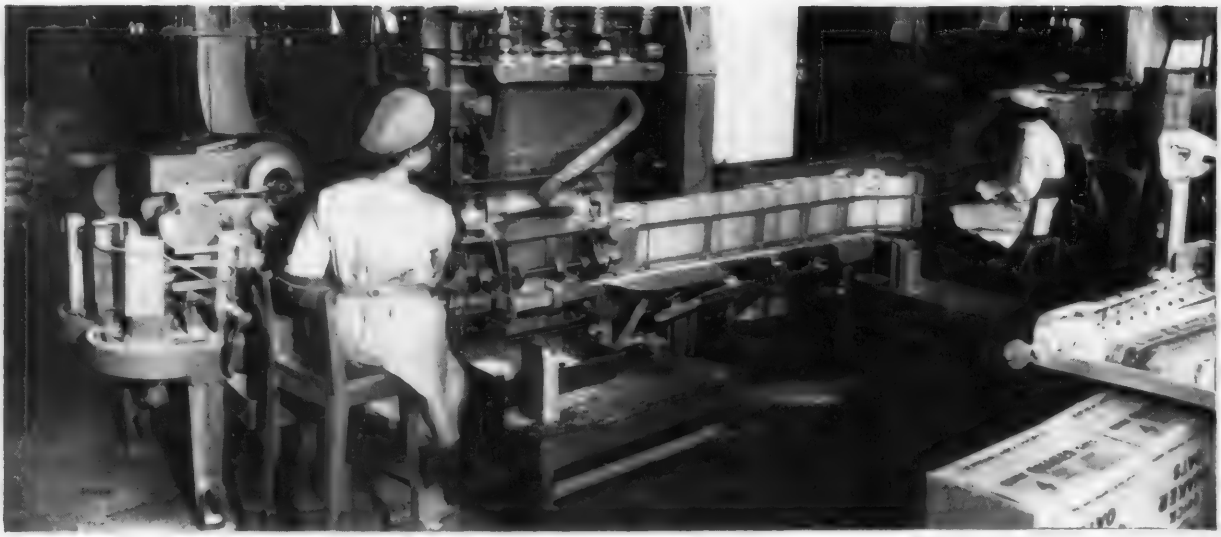
Printed cartons are used for this product in the packaging department, but before filling, the empty cartons pass by conveyor through a machine which makes the waxed paper bags and inserts them in the cartons. After filling and closing, the sealed cartons pass by conveyor for packing into large containers. These in their turn are conveyed to the automatic case sealing machines and delivered by chute to the despatch bay.

By-products from the manufacture of puffed wheat are available for use in the production of animal feedingstuffs and pass to the company's compounding plant for this purpose.

Macaroni Production

Quaker Quick Macaroni production started up two years ago when the company decided to put on the market a first-class product, attractively packaged, and made from the best semolina obtainable. Elaborate plant, purchased from Switzerland and built by the company, made possible the introduction of this new quick-cooking

Cartons for Quaker products are made in the factory.



The packaging line for Quick Quaker Oats.

product which can be cooked in seven minutes instead of the usual half-hour.

Growing Demand for Macaroni

In October, 1948, when the production of macaroni was first started, the company was operating with one press only, which ran for twenty-four hours for seven days a week for six months. At the end of this period, demand for the product had so increased that the machinery was doubled to meet it.

After a further nine months' operation, it became obvious that demand was still exceeding supply and the plant is once more in the process of being increased, so that eventually the capacity will have been increased almost four-fold during the two years of macaroni production.

The macaroni is made from semolina which has been produced to the company's own specification entirely from Amber Durum wheat. After dressing, the semolina is fed by worm conveyor at predetermined rates to the presses which automatically draw semolina and water to make the dough which is kneaded and extruded into the macaroni shape.

This plant follows the modern trend of replacing batch operations with continuous processes, the machine proportioning the ingredients, mixing, kneading, pressing, and extruding in one automatic continuous operation.

After extrusion, the macaroni is conveyed to the continuous driers which are temperature and humidity controlled. This particular process in the manufacture of macaroni is the most critical in the entire sequence of operations. If drying is too rapid, surface drying occurs; if too slow, there is a danger of undesirable biochemical changes taking place. The whole process takes from twelve to twenty hours.

The finished product passes to the packing floor for automatic filling into cartons and sealing, after which operatives pack the cartons into outer cases before they are conveyed to the case sealer for final glueing and despatch to the loading bay below.

All glue used for case sealing and labelling is made in the mill from dextrin and pumped into holding tanks from which it is fed by pipeline to the packing floor below.

After filling into cartons, the corn flakes are packed into large containers.

Despatch Floor

Chutes from the packing floor cascade the sealed containers in a steady stream to the despatch floor for stacking. Very little storage of the finished goods takes place at Southall, the products being

despatched by rail and lorry almost immediately following their manufacture to ensure that they reach the consumer in the freshest possible condition.

Milling Research

In the field of research, a leading part has been played by the company in the development of improved methods of milling all types of grain. There is also an interchange of technical information between Quaker Oats, Ltd., and associated companies in America and other parts of the world covering the manufacture of cereal breakfast foods.

Southall has its own laboratory for the testing of new products and process control, every item of raw material, packaging materials, and finished products being tested to ensure their conformity to the company's rigid specifications.

Through the years, the company has worked unceasingly to produce better products at the most economical price possible. It has pioneered the development of new packaging machinery and equipment to cut costs, the benefits of which have, where possible, been passed to the consumer in the form of lower retail prices or increased weight per pack.

Photos: Leonard Hill Ltd.

SUPPLIERS OF EQUIPMENT

Weighing machines: *W. and T. Avery.*
Balance: *L. Oertling.*
Lifts: *Waygood-Otis.*
Rolls: *Thos. Robinson and Sons.*
Toasting ovens: *E. R. and F. Turner.*
Automatic weighing machines: *George Driver and Son; Southall and Smith.*
Rotary louvre driers: *Dunford and Elliott.*
Rotary graders: *Thomas Locker and Co.*
Mountings for puffing guns, etc.: *Silentbloc.*
Macaroni presses: *Buhler Uzwil Bros., Switzerland.*
Instrumentation: *Bristol's Instrument Co.; Drayton Regulator and Instrument Co.; Honeywell-Brown; Cambridge Instrument Co.; Negretti and Zambra.*
Groat cutters: *Kipp-Kellie, Canada.*
Carter disc separators: *Henry Simon.*
Man elevators: *Thos. Robinson and Sons.*
Carton-making machine: *E. G. Staude Manufacturing Co., U.S.A.*
Packaging machines: *J. L. Ferguson Co., U.S.A.; Pneumatic Scale Corporation; Stokes and Smith.*
Case sealing machines: *Rose Bros. (Gainsborough).*
Fibreboard packing cases: *Thames Board Mills.*

Drying by Sublimation

DURING the past ten years the development of freeze-drying has made very rapid progress both in the laboratory and industry, resulting in the publication of a great many scientific and engineering papers.

The purpose of a recent book* has been to bring together all published technical knowledge on the subject, in addition to much unpublished material.

Freeze-drying Process

In the process of freeze-drying, or drying by sublimation, the product is frozen and the ice is then sublimed rapidly under high vacuum. With many materials, the solids contained originally are left in shape and the overall volume corresponds closely to that of the original frozen product. The advantages of this process are explained at length in this book; two of the major ones are: (1) the properties of labile substances are unchanged during drying, with consequent prolonged preservation of desired characteristics during the storage period which follows; (2) the solubility of products dried in this way is remarkably rapid and complete. As a result, the life of commercial labile products can be greatly extended.

The basic principles of the method are fully and clearly described. This section is followed by one on its applications, which are mainly concerned with medical products and the drying of human blood plasma and normal serum, anti-toxins and other antisera, bacterial and viral cultures, and similar materials.

Application to Food Products

The applications of freeze-drying to food products is described, but it is evident that here they are limited. It is the author's opinion that orange juice offers great promise for drying by sublimation, as dehydrated orange juice should find a promising market around the world where distribution of fresh fruit is impracticable. This applies also to the juices of many tropical fruits, such as those of guava, naranjilla, and papaw. From juices of vegetables such as carrots, celery, and peas an excellent product is obtained which reconstitutes in a few minutes, with flavours comparable to those of frozen foods. The author sounds the warning that with such products as these the cost of operation probably prohibits displacement of fresh vegetables, but for special purposes and specialty products there is definitely a wide scope.

Meat Processing

Freeze-drying of meats is discussed, and it is the author's opinion that the cost considerations in this connexion are relatively attractive, the content of moisture to be removed being low with reference to the price of the product. Since storage under refrigeration is unnecessary, meat dried in this way is of value for pantry storage and for many other purposes where fresh meats are ordinarily unavailable because of lack of refrigeration.

Other products which have been successfully dried by the sublimation process are oysters, fish fillets, milk, coffee and tea extracts, and vegetables.

Plant Requirements

The final chapters, which are well illustrated, describe the equipment used for medical products and foods, and some useful tables showing typical estimates for total costs are included.

The bibliography at the end of each chapter consists mainly of references to American work, but some mention is made of British work.

This book is excellently produced and may be recommended to those who wish to obtain up-to-date information on this particular branch of dehydration.

* *Freeze-drying. Drying by Sublimation.* By Earl W. Flosdorf. Pp. 280+vii. Reinhold Publishing Corporation, New York, and Chapman and Hall, London. Price 40s.

Vitamin Research

In his latest publication* Dr. W. H. Eddy, one of the pioneers in vitamin research, has attempted to survey in some 350 pages the chemistry and function of the vitamins. Most of those actively engaged in the field would no doubt regard this as an impossible task, and will wonder how the author has selected his material from the vast literature available in order to keep the book within reasonable bounds. Perhaps with a less ambitious title, Dr. Eddy might have succeeded in more nearly achieving his objective. As it is, we have a book which is very useful in some respects but uneven in the way some branches of the subject are dealt with and frankly disappointing in its treatment of the chemistry of the vitamins.

The longest chapters relate to vitamins A and D and folic acid, with chapters only a few pages shorter on aneurine, riboflavin, and ascorbic acid. The best chapters are those on folic acid, biotin, and vitamin P, the last being an extremely able summary of information in a somewhat confusing field. The excellence of these chapters is perhaps due to the inclusion of a far higher proportion of the information available than is contained in the chapters relating to the older and better-known vitamins. The book would have gained a great deal had the author allowed himself space to deal more adequately with some of these.

Dr. Eddy is at his best in describing the physiological properties of each of the vitamins and the way in which they exercise their biological effects. Other aspects of the subject are dealt with in a less satisfactory manner. It is surprising, for example, that so little is said about the amount of different vitamins in foodstuffs. In the chapter on aneurine, for instance, the only food referred to is fortified flour, and in the chapter on vitamin D reference is made to the amount in fortified milks, but no mention is made of the vitamin contents of unprocessed cereals and milk, on which the world outside the U.S.A. continues to subsist.

The greatest omission, however, concerns the chemistry of the vitamins, which is dealt with in a very perfunctory manner. Unfortunately also many of the formulae contain errors, often only in the substitution of a double bond by a single bond, but some are more serious. One of the most unfortunate errors is the formula of methyl naphthaquinone, which is in fact that of toluene, while on a page containing the formulae of seven analogues of vitamin K, three are incorrect and it is quite impossible to determine from the text what in fact they are meant to be.

Another unfortunate mistake arises from the identification of pyrithiamine, which is a pyridine analogue of aneurine, with pyramine. It is the latter and not pyrithiamine that is excreted in urine following the ingestion of aneurine. An important metabolite of nicotinic acid, N^1-methyl-6-pyridone-3-carboxylamide, is given the misleading name of N′-methyl-6-pyridone-niacinamide, while the repeated use of the name "ureylene cyclohexl" (*sic*) instead of ureylene cyclohexyl butyric acid will puzzle a good many readers.

It is greatly to be regretted that the editing was not carried out sufficiently carefully to avoid these mistakes, which so seriously mar the readability and reliability of what might otherwise have been a very valuable book of reference, and it is to be hoped that the text will be very carefully revised prior to the next edition.—F. A. R.

* *Vitaminology. The Chemistry and Function of the Vitamins.* By Walter H. Eddy, Ph.D. Pp. 365+v. The Williams and Wilkins Company, Baltimore, and Baillière, Tindall and Cox, London. Price 46s. 6d.

TO AUTHORS

Food Manufacture is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

Standard for *p*H Scale

As the result of a suggestion by the Royal Society that a standard *p*H scale was eminently desirable and that it should be such as to meet international agreement including, if possible, agreement with the scale already proposed in the United States, a British Standard for *p*H scale (B.S. 1647: 1950) has been prepared.

Originally, *p*H was intended to denote $-\log_{10}C_H$, where C_H is the hydrogen-ion concentration. It is now realised that, if thus defined, *p*H is not measurable, and accordingly an operational and, to some extent, arbitrary definition has been adopted.

The object of the standard is to ensure that, when different workers refer to a stated measured value of *p*H, they mean the same thing within ±0·005. The standard makes it quite clear that this degree of accuracy is only attainable with aqueous solutions at temperatures between 0° C. and 60° C., and that oxidising agents or other highly reactive materials tend to reduce this accuracy.

The method of measurement is given, the primary standard being a one-twentieth molar solution of pure potassium hydrogen phthalate, of which the *p*H is defined as having a value 4 exactly at 15° C. A list of six secondary standards is also included for the use and calibration of the glass electrode. The *p*H values adopted for the primary and secondary standards are those which have recently been determined by workers in the United States, using the same technique as specified in this British Standard, and which are reliably known to an accuracy of ±0·005 (MacInnes, Belcher, and Shedlovsky, *J. Am. Chem. Soc.*, 1938, **60**, 1094; Hitchcock and Taylor, *ibid.*, 1938, **60**, 2710). It is very desirable that this list of secondary standards should be extended, but additions are not possible until measurements are made with the hydrogen electrode, comparing the *p*H of solutions of these additional substances with the *p*H of the primary standard in accordance with this British Standard.

Progress in Dairy Chemistry

J. G. DAVIS, D.Sc., Ph.D., F.R.I.C.

Part II

In this survey of the literature, the author has collated data on recent developments in dairy chemistry and discusses advances in research covering a wide range of dairy products.

A SERIES of important papers on the physics and chemistry of butter has appeared in *Milchwissenschaft*. Fritz and King[104] have reviewed the physical state of the fat and water in butter. They attach considerable importance to the quantity and nature of the free fat in butter and point out how different butter-making methods are reflected in this aspect. Mohr and Baur[105] describe methods for measuring the "free oil" in butter. Schulz and Schulz[106] have given a most useful and critical survey of the advantages and disadvantages of the new and old methods for butter making. Their article contains many good illustrations, and is further discussed in the same journal (p. 310 and 344). Mulder[107] does not accept the phase reversal theory of butter formation; he postulates two continuous phases, the fat globules and water droplets being joined by bridges or canals.

Petersen[108] has emphasised the significance of *p*H control for the prevention of oily and fishy taints in butter.

Neseni[109] gives some interesting data on the nitrogenous substances in butter, and Antonini and Creach[110] give analytical data for butter made by natives from zebu milk in the Chad.

Schulz[111] has devised an ingenious specific gravity method for determining the air content of butter. Churn butter contained from 3 to 5 per cent., Fritz 5 to 10, and Alfa butter was generally free from air.

Mohr and Wellin[112] have used measurements of cutting resistance, viscosity, and "cone melting point" to assess the consistency of butter. Further data are given by Mohr and Schulz.[113] The consistency of butter, etc., has been studied by Berglund[114] using a loaded punch applied for a given time.

Terskikh[115] describes an interesting haemolytic test for fats; those from good quality butter showed no haemolytic properties, while those from butter after prolonged storage haemolysed defibrinated human blood.

Nath *et al.*[116] have repeated the separation by crystallisation from acetone of a butter fraction which gave superior growths with rats.

Mulder[117] has studied the factors controlling the formation of the "yellow skin" on butter. A dry atmosphere without oxygen or with oxygen in the dark induced this yellow skin; a moist atmosphere failed to produce it and light and oxygen bleached the surface. The author disputes Effern's claim that the colour arises from oxidation at the surface. (Surface evaporation is also responsible for the deepening of the colour of cheese.)

Butter Flavour

Waarden[26] has published a monograph on his studies of the deterioration of butter flavour in cold storage. It is considered that oxidised substances first form in the aqueous phase and then oxidise lipids at the fat-water interface. Evidence is put forward to suggest that the offensive taints are due to straight-chain, unsaturated aldehydes with from 4 to 8 carbon atoms.

Grant *et al.*[118] have followed the deterioration of ordinary and canned butter by a series of biochemical tests. Canned butter had a superior keeping quality, and these authors emphasise the importance of protein-decomposition products in the aqueous phase as a factor in flavour. As usual, there was a closer correlation between flavour and chemical tests than between flavour and bacteriological tests.

Virtanen and Nikkila[119] have shown that malty flavour in butter and starters is associated with the formation of acetaldehyde from pyruvic acid by the "malty *streptococcus*."

King[120] has described a modification of the Ritter test for the rapid estimation of acetyl methyl carbinol (acetoin) + diacetyl in butter cultures. A controversial note is introduced into the diacetyl question by the claims of Cuppine[121] that although acetoin and butylene glycol are found in milk they are not oxidised to diacetyl and that this last substance is not found in butter.

Holverda and Geest[122] have shown that there is a good correlation between taste and smell, and diacetyl content of butter, 78 per cent. of butter of grade marking >7 having a diacetyl content of at least 1·2 mg. per kilo.

Cheese Research

Whitehead[123] concludes that fat helps to retain moisture in cheese, and that low-casein-milk curd retains moisture more tenaciously than high-casein-milk curd. These two effects tend to cancel out, but the "casein effect" is usually more powerful than the "fat effect."

Hlynka and Hood[124] have described a simple method of estimating the acidity of cheese fat. Rancid and unclean lipolytic flavours can be induced in cheese by agitation of the warm cheese milk, and the acid fat value can be used as a measure of this lipolysis.

Peterson *et al.*[125] measure the lipase content of cheese by incubating the cheese extract with tributyrin at *p*H 5 at 40° C. The lipase is most active at this *p*H, but a secondary optimum occurs at *p*H 6·5. Milk lipase is most active at *p*H 8·6, and the authors consider that this plays no role in cheese ripening, and that the lipolytic activity of ripening cheese is

due to autolysis of bacteria, possibly lactic acid bacteria. Eigel[126] has reported on the flora and structure of Camembert cheese. The surface layer is eight to nine days more advanced in ripening than the core. Peters and Nelson[127] have ripened blue cheese with a cell-free lipase preparation from *Mycotorula lipolytica*. The best cheese had total volatile acidity values of 30-50 ml. $\frac{N}{10}$ acid per 200 g. cheese. Above this the cheese was "sharp and soapy."

Cheddar Cheese Investigations

Dahlberg and Kosikowsky[128] have made Cheddar cheese with a starter of *Str. faecalis*, and claim a better flavoured cheese of more mellow and waxy body than that made with a lactic starter. They further report on the survival of *Str. faecalis* in cheese[129] and the concentration of tyramine[130] was found to be 0·0384 per cent. on the average, varying from 0·0025 to 0·1199 per cent. They find that there is a semi-logarithmic relationship between tyramine content and intensity of flavour.[131] Tyramine was not the Cheddar flavour compound, but served as an indicator of flavour-production.

Peterson *et al.*[132] have found that Cheddar cheese proteinase is most active at *p*H 5 with a secondary optimum at *p*H 7 to 8. Reducing agents (potassium cyanide and cysteine) accelerated proteinase activity. Most of the active proteinase is of bacterial origin.

Mogensen[133] has described a system for determining the degree of proteolysis in cheese and found the greatest degree of protein breakdown in Stilton cheese.

Horwitz and Knudsen[134] have studied the reproducibility of some methods for determining fat and moisture in cheese. The laboratory factor was greater than the sampling factor.

Blognaerts[135] has made some critical comments on methods for determining fat in cheese.

Hlynka and Hood[136] have shown that the brown discoloration developing when malted cheese is stored at atmospheric temperatures is due to the interaction of aldoses with amino acids. Addition of bisulphite prevented the discoloration.

A method for the continuous production of processed cheese has been described by McCarthy.[137]

Vergue[138] has compiled a review on food poisoning in cheese.

Cook and Day[139] have written a survey of the importance of milk powder in America.

Thiel *et al.*[140] have described an apparatus for the routine estimation of oxygen in tins of milk powder, and Hetrick and Tracy[141] have used a manometric method for measuring the amount and composition of the gas desorbed from vacuum packed powder.

Mohr[142] has compared methods for determining the fat in milk powder and baby foods and recommends the Weibull-Stoldt procedure. He gives the error as ±0·1 per cent. (*e.g.* 25±0·1 per cent.).

Keeping Quality of Milk Powder

Considerable attention has recently been paid to the value of a high pre-heating temperature. White *et al.*[143] have found that raising this from 160° to 190° F. increased the keeping quality (by taste) by three or four times. Ethyl gallate achieved the same result, and the two procedures together achieve an eightfold increase in the life of the powder. Henry and Kon[144] were unable to find any loss in biological value of the protein as the result of the higher temperature treatment. Henry *et al.*[145] have studied the deterioration of stored skim milk powder. Little change occurred with moistures below 5 per cent., but above this the powder rapidly became discoloured, unpalatable, and insoluble. The *p*H, free amino-N, and soluble lactose fell, the lactose-protein components increased, oxygen was absorbed, and carbon dioxide was produced. The causes of off-flavour are complex and no single chemical test correlated well with the tasting panel score. The biological value of the protein also decreased, especially at high storage temperatures, probably because of the loss or inactivation of lysine.

Tarrasuk and Jack[146] have shown that the browning of milk powder is not linked with flavour defects, rather tending to inhibit them. Browning did not occur when the moisture content was below 4 per cent. Manus and Ashworth[147] have confirmed the value of high pre-heating temperatures in respect of good keeping quality. They find[148] that precondensing to 40 per cent. solids leads to a higher solubility, but pre-heating at 180° F. to a lower solubility after storage. They describe a quick method for determining the density of whole milk powder; this increases with increasing pre-condensation of the milk. Ault[149] has also described a method for the apparent density of powders. Culter *et al.*[150] have found that high moistures and temperatures of storage lead to the development of stale or "burnt feather" flavours, reducing substances, oxygen absorption, browning, loss of lactose, acidity, and protein insolubility.

Horwitz[151] has shown that if the Na of skim milk powder is plotted against the Cl, all the points for neutralised powders lie to the right of the line Na = 0·62 Cl − 0·1 and those for unneutralised powders all lie to the left of this line. The Hillig alkalinity of ash method is quick but lacks precision.

Borrell[152] has shown that β-lactose disappears during the storage of skim milk powder, the destruction being accelerated by moisture and temperature. At a moisture of 2·7 per cent. the loss is negligible.

Condensed and Evaporated Milk

Webb and Hufnagel[153] have found the viscosity of sweetened condensed milk to increase logarithmically with increase in storage temperature and arithmetically with time. The logarithmic temperature-time relationship may be used for predicting behaviour at other temperatures. The colour of evaporated milk is superior with a H.T.S.T. process, and Nelson[154] gives data on this subject and discusses the application of his method of measuring colour during processing.

Deysher and Webb[155] report

that the crystalline deposits in evaporated (unsweetened) milk consist usually of about 98 per cent. calcium citrate, the residue being tricalcium and trimagnesium phosphates. The latter may be as high as 10 per cent.

Cream Research

Willsmann[156] has given a comprehensive mathematical treatment of the theory of the cream separator in a well-illustrated article.

Claydon[157] has described a simple colour test for the grading of cream. Crystal violet and NaOH are added. The test appears to be influenced by both acidity and the physical condition of the cream, poor cream giving darker colours.

Mohr and Wellon[158] have shown that in cream of more than 75 per cent. fat the globules are packed so closely that they deform each other. This appears to be the first stage in the Alfa process (phase inversion of 80 per cent. cream). The same authors[159] find that viscosity increases rapidly above 60 per cent. fat over the temperature range 104°-140° F., that of 40 per cent. at 122° F. being about 5·2 and that of 80 per cent. varying from 3,320 to 6,720 cp.

Pyenson and Tracy[160] have studied the aeration-whipping of cream powder. Satisfactory results were obtained with a product reconstituting to 30 per cent. fat, 7-8 per cent. milk S.N.F., 5 per cent. sugar, and 0·3 per cent. emulsifying agent. High spray pressures were detrimental to whipping. The keeping quality of the mix was improved by packing in inert gas and addition of antioxidants, the most effective being pure vanilla concentrate.

Homogenised Milk and Whey

Trout[161] has contributed a most useful review of nutrition aspects of homogenised milk.

Babcock *et al.*[162] have continued their studies of frozen homogenised milk. The behaviour of stored homogenised milk after thawing is similar to that of the ordinary product. If homogenised milk is to be frozen, it should be so treated as soon as possible, but it will keep up to 120 hr. at 1·7° C. before freezing without sustaining any adverse effect.

Webb and Whittier[163] have compiled an extensive and comprehensive review on the utilisation of whey.

Choi *et al.*[164] have developed a moisture desorption method for estimating the water of crystallisation of, and so indirectly the α-lactose-hydrate in, whey solids. The method is independent of particle size.

Demmler and Kumitat[165] have reviewed the commercial deterioration of whey and suggested criteria for assessing quality.

Schulz and Fackelmeier[166] have described a fermented whey fruit juice drink (Milone). Ohler[167] has used fermented whey to preserve cucumbers, pickles, etc. Friedel[168] discusses problems in the filtration of whey, and Roeder[169] has given correction data for hydrometer measurements on whey at different temperatures.

Ice Cream Manufacture

Smith *et al.*[170] have employed a mixture of perchloric and acetic acids instead of sulphuric acid in a Babcock test for fat in ice cream.

Dahlberg and Loosli[171] give analyses of typical ice creams (N.Y.) as follows: protein 3·85 per cent., fat 12·06 per cent., carbohydrate 21·3 per cent., total minerals 0·81 per cent., Ca 0·12 per cent., P 0·11 per cent., Fe 0·12 mg. per cent., aneurin 0·038 mg. per cent., riboflavin 0·236 mg. per cent., nicotinic acid 0·098 mg. per cent., vitamin A 548 I.U., ascorbic acid nil. The average energy value was 206 Cal. per 100 g.

Johnson[172] has discussed the precautions necessary for quality in ice cream, and Webb[173] has given a highly concentrated digest of the basic principles in ice cream manufacture. Humphriss[174] has dealt in some detail with practical aspects of mix formulation and with cooling problems in small units.[175]

Clayson and Pirie[176] have criticised the new methylene blue test for the hygienic quality of ice cream. They have shown that thermoduric organisms surviving the required heat treatment can reduce methylene blue under the conditions of the test, especially in the presence of milk powder and margarine.

Gould and Potter[177] have used the *true* lactic acid content (Hillig's method) as a measure of ice cream quality. Fresh mixes gave values of 5 to 7 mg. per cent. There is no relationship between true lactic acid and titratable acidity and *p*H values.

Miscellaneous Products

Soya bean milk has recently been introduced in U.S.A., and Gehrke and Weiser[178] have shown that the aroma streptococci produce similar amounts of aroma substances in both soya milk and ordinary milk.

Bryan[179] has briefly discussed the mechanism of the corrosion of aluminium, which is of interest in view of the fact that this metal is still extensively used in the dairy industry and there has recently been an interest in aluminium cans.

Portley[180] has summarised the published data on the usefulness of the quaternary ammonium compounds in the dairy industry.

Milk Preservatives

The subject of milk preservatives still attracts attention, although their use is illegal in most countries. Gibbons and Brown[181] report that chloropicrin (microlysine) at a concentration of 50 to 75 p.p.m. kept milk fresh at room temperature for three to five days, although there was a detectable flavour.

Pien[182] recommends the addition of 1 to 2 ml. of 130 vol. H_2O_2 to 1 litre to preserve milk in France in a pasteurisable condition. He considers that about 10 per cent. of milk arriving at pasteurising depots in Paris is unfit for use.

Southgate[183] has given a concise digest of recent work on the treatment of waste waters from dairies, with special reference to the comparison of alternating double filtra-

(*Concluded on page 498*)

Food Hygiene in Scandinavia

LEGISLATION in Norway and Sweden plays a considerable part in maintaining the high standard of food hygiene, which must contribute largely towards the absence of food poisoning in both countries. Two other outstanding factors, which may be even more important, were evident to the Principal Medical Officer of the Ministry of Food (*M.O.F. Bulletin*, No. 550) during his recent visit to Scandinavia: the almost universal refrigeration of stored foods, and the fact that precooking and reheating of such foodstuffs as soups, gravies, stews, and custards are rarely practised.

Powers of Local Authorities

In both countries the law governing food hygiene is similar to that in Britain. Powers are vested in local authorities by one general Act couched in wide terms, and by more detailed regulations or bye-laws drawn up as required. The degree of severity with which local authorities interpret the regulations varies, and the functions of central government in relation to food hygiene are mainly advisory.

In neither country are food handlers examined medically, except those in the milk trade, who are said to be examined every year. All milk supplied in towns must be pasteurised, although bovine tuberculosis has been almost eliminated. Owing to a shortage of glass, milk is still sold "loose," but it is hoped to introduce compulsory bottling in the near future.

Hotel and Restaurant Inspection

In Stockholm, hotels and restaurants are inspected about once a month. Kitchens, sculleries, store rooms, and rooms used for preparing vegetables, etc., and for washing up are large and uncrowded. Tables, benches, and sinks are made of stainless steel whenever possible. Ventilation and lighting are uniformly good, and new licences are not granted to establishments with underground kitchens.

The health authorities insist on a separate wash basin with constant hot water, towels, and soap for the use of the staff.

Particular attention is paid to the cleansing of crockery and utensils. A sink for preliminary rough rinsing of dishes is frequently provided. Glasses are washed separately in an approved phosphate-silicate detergent solution, but most restaurants have automatic washing machines of patterns approved by the health authorities.

Food Protection in Shops

Food in shops is carefully protected from dust and dirt, and all counters have glass fronts so that goods can be seen but not handled. In shops selling fish and meat, only small quantities are shown at any one time, and meat is always kept under glass behind the server.

There is a striking contrast between conditions in Sweden and the austerity which has prevailed in Norway as a result of the war, but in spite of a lower standard of equipment, the Norwegians insist on a high degree of hygiene and take all the essential precautions against infection. The law and methods of administering it are much the same as in Sweden, and new regulations have recently been passed.

Sterilisation of Crockery

Sterilisation of crockery and cutlery is compulsory in all premises. Where there is no automatic washing machine, the usual method is to wash the dishes in stainless steel sinks and then to steam them in a large metal cauldron with a tightly closing lid. Glasses need not be sterilised, but must be cleaned with an approved detergent. Cracked crockery is not prohibited by law, but, as in Sweden, all crockery is very much thicker than that commonly used in Britain.

In shops, for the most part, the handling of food by customers is a punishable offence, and goods are kept behind glass and out of reach.

Progress in Dairy Chemistry

(*Continued from page* 497)

tion with addition of coagulants followed by single filtration.

Useful data and suggestions for the treatment of dairy effluents are given by Oeming,[184] Bloodgood, and Steffen.[185]

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161 *ibid.*, 627, 1948.
162 *ibid.*, 805 and 811, 1948.
163 *ibid.*, 139, 1948.
164 *ibid.*, 619, 1948.
165 *Milchwissenschaft*, 138, 1948.
166 *ibid.*, 165, 1948.
167 *Chemical Abstracts*, 8986, 1948.
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170 *J. Dairy Science*, 905, 1948.
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175 *ibid.*, 1021, 1948.
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179 *Chem. and Ind.*, 135, 1948.
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181 *Can. Dairy and Ice Cream J.*, **27**, (5), 36, 1948
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The Ventilation of Ships' Holds

The interest in the question of the ventilation of dry-cargo vessels arises out of the search for means to meet two conflicting requirements. On the one hand, a cargo should be ventilated continuously in order to avoid the condensation on the ship's structure of moisture which is being disengaged from the cargo; while, on the other hand, by admitting air with a dewpoint above the temperature of the ship's structure or of the cargo, the risk is run of wetting either or both with moisture derived from the ventilating air. The means of controlling condensation on board ship described in this paper is, in the main, the work of a small group of engineers who started in Seattle in about 1935, and as a result of their researches the Cargocaire Engineering Corporation was developed.

THE suppression of condensation on board ship is difficult to achieve. Cargoes often contain much natural moisture, even when they are apparently dry, as the following table shows:

	Moisture Content. Per cent.
Cocoa beans	6–8
Cereals:	
Maize (Plate)	11–14·4
Maize (Danube)	17–19·5
Rye (Polish)	17–19
Wheat	10–14
Coffee	8·5–10·6
Dried Fruit:	
Apricots	28
Prunes	24–28
Raisins	17–28
Sultanas	18–19
Oil Seeds:	
Copra	3·4–5·6
Cottonseed	7·1–9·5
Groundnuts	4·4–5·6
Linseed (Plate)	5·9–12·1
Soya	7·9–12·1
Tea	6–8
Hides and Skins:	
Dry	14–20
Dry salted	14–20
Wet salted	40–50

The storage atmosphere of any such cargo—that is, the condition of the air within its interstices—remains steady. It is held steady by the moisture in the material, which forms a great reservoir, from the surface of which moisture is usually evaporating slowly.

Moisture Content of Cargo

The moisture content of cargo changes little during a voyage; the change in weight is rarely more than one half of one per cent., and usually represents a loss. The gain or loss of moisture, to which the change in weight is due, takes place at the exposed surfaces of the goods.

Abstract of a paper read by S. J. Duly, M.A., before the Royal Society of Arts on April 5, 1950, and published in the Journal of the Society.

The temperature of the goods is affected by external conditions, but, apart from the influence of continued warmth from bulkheads next to machinery spaces, changes in temperature within the bulk are usually slow. The temperature of the cargo lags behind the general rise or fall in sea-water temperatures as the vessel changes latitude. Within the bulk it tends to remain at its loading temperature. As long as the moisture content and the temperature of the goods do not change, the dewpoint of the air in the goods remains constant. A rise in temperature soon raises the dewpoint of the storage atmosphere; and when this happens, moisture evaporates more freely from the surface of the goods.

This natural controlling effect on the atmosphere in their neighbourhood is exercised only by hygroscopic materials such as those listed in the Table. They absorb moisture from the atmosphere, or give it out, as the case may be. Cargoes containing little or no moisture, such as metals, machinery, or canned goods, condense moisture derived from other cargo or from the outside air if they are cold enough. Low loading temperatures, and stowage over refrigerated spaces or in insulated but unrefrigerated spaces, may produce these conditions.

Again, the influence of atmospheric conditions at sea is difficult to counter. The air is often damper than the storage atmosphere set up in the hold by the goods themselves. At such times, cargo will become damper by being ventilated with the atmosphere, though here again the effect is likely to be superficial. Then, the deck is cooled by wind and rain, and condenses moisture

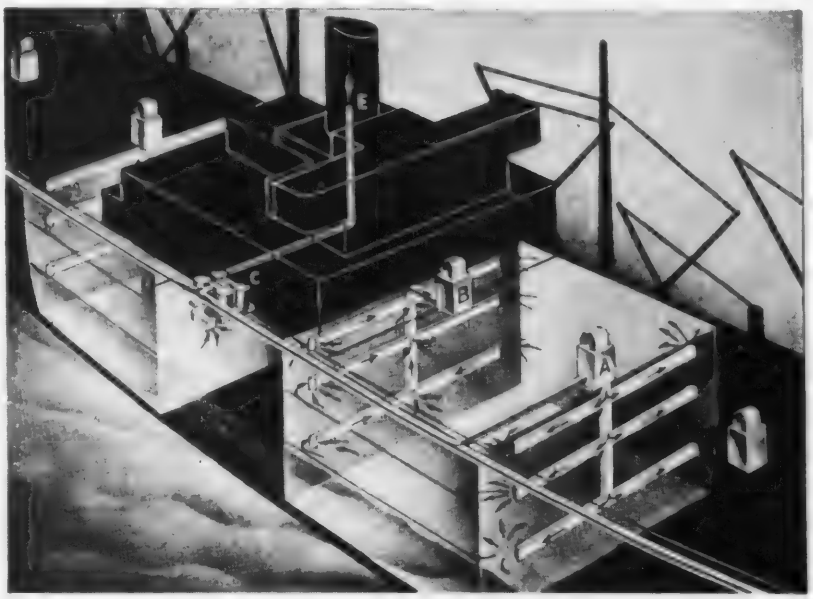


Fig. 1. The Cargocaire system of ventilation and dehumidification. A: Supply fan housing and recirculation opening. B: Exhaust fan housing and recirculation opening. C: Cargocaire unit. D: Dry air duct. E: Damp air exhaust.

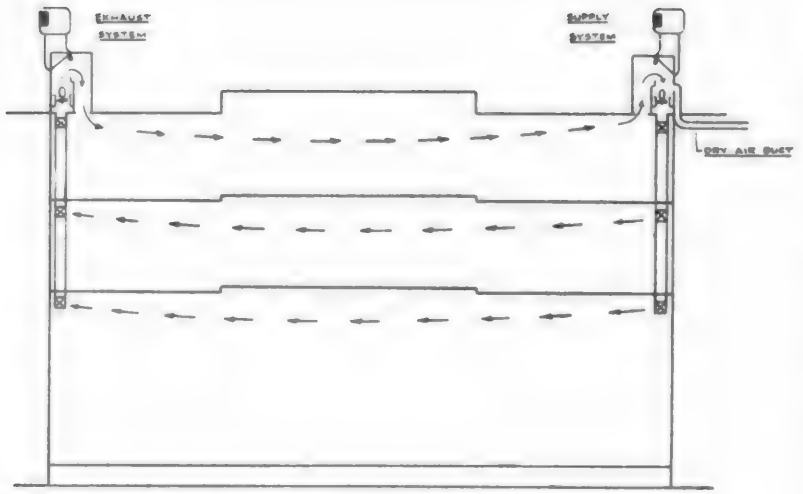


Fig. 2. Section of hold showing recirculation of air.

on its underside. The moisture in this case is derived from the cargo, and the sweating is particularly marked when the goods are relatively warm.

Constructional Difficulties

The final difficulty in suppressing condensation arises out of the ship's construction, which leaves much to be desired in this respect. Temperatures on board ship are hardly ever uniform throughout the cargo compartments. Proximity to machinery spaces makes some stowages warm, and the presence of refrigerated spaces makes others cold.

No single improvement in general cargo compartments could equal the provision of means to ensure uniform temperatures throughout their length and breadth. Warm storage raises the dewpoint of the storage atmosphere of commodities containing natural moisture, and cold surfaces condense the moisture so derived. Steelwork maintained artificially cold condenses the moisture from sea air even in dry weather. It also cools the cargo in its neighbourhood, so that moisture condenses on it too. One well-known firm has gone so far as to warm such dangerous surfaces by electric heating strips applied to the steelwork and insulated from the air in the cargo spaces, so as to maintain the temperature of the steelwork above the atmospheric dewpoint.

Systems of ship dehumidification may deal with natural conditions, but gross inequalities in temperatures in the storage spaces defeat their object and have been held in particular circumstances to constitute unseaworthiness.

The above principles were much discussed in the late 'twenties and in the 'thirties, and as they are not difficult to grasp they became generally well known.

There was, however, considerable resistance to proposals to stop ventilation whenever the atmospheric dewpoint was high. Masters' experience was that condensation was brought about by closing ventilators. In not ventilating a cargo to avoid condensation of moisture from sea air upon cargo or upon ships' steelwork, a bigger risk was run of condensation of moisture derived from the cargo, and particularly from cargoes in warm stowage, upon ships' steelwork. In consequence, these rules were restricted to particular trades and particular cargoes where they could be safely applied.

Use of Dry Air

Then the Cargocaire Engineering Corporation of Seattle proposed the use of dry air to be introduced and circulated through the cargo space when the ventilators were closed. The first installation was made in 1938.

In their installations, motor-driven fans replaced cowl ventilators. A supply fan at the after end of the hold, usually housed on deck amidships, and an exhaust fan at the forward end of the hold, replaced the customary four cowl ventilators. The fan housings were designed to permit ventilation in bad weather, so that the fans could be run continuously throughout the voyage.

With traditional cowl ventilation, air is introduced into the cargo spaces through circular or annular openings in the decks, and withdrawn through similar openings. In the new system, the air supplied by the fans is distributed to the cargo holds through carefully designed ductwork, the openings in which supply air in the appropriate quantities where it is needed. The ductwork for withdrawing the air from the opposite end of the hold matches the supply ductwork. In these installations, the ductwork is of steel plate, rectangular in cross section and attached to the underside of the deck at the various deck-levels by hangers welded to the sides of the duct, and is sufficiently robust to withstand rough treatment.

Closed System of Circulation

To meet the requirement that ventilation should be continued when the atmosphere at sea is damp, a closed system of circulation of the air between bulkheads was adopted, to be put into operation when the dewpoint of the atmosphere rose above that of the air issuing from the exhaust ducts. The earlier practice was to use the temperature of the cargo as the guide in determining when to restrict ventilation. The temperature of the cargo was to be compared with the dewpoint of the external air. In these new installations, it is the dewpoint of the issuing air that is used as the criterion. This changes the emphasis to that part of the cargo which is hygroscopic and influences dewpoints.

There are advantages in using the dewpoint of the air issuing from the hold in place of the temperature of cargo. The dewpoint of the air issuing from the hold is easier to take than the temperature of the cargo. As its dewpoint is always lower than its temperature, ventilation is stopped earlier and started later than it would

have been had the temperature of the issuing air been taken to represent the average temperature of the cargo and used instead. The practice is, in fact, to use the atmosphere as the ventilating medium whenever it is drier than the air in the hold, but otherwise to recirculate the air in the hold.

Recirculation Methods

When the closed system is being used, the supply fan takes its air from the upper tweendeck instead of taking it from the atmosphere, and the exhaust fan returns it to the upper tweendeck instead of exhausting it to the atmosphere. This practice has been widely imitated, and is referred to as "Recirculation." If the ductwork is athwartships, as it usually is, recirculation results in the air in the uppermost deck moving in one direction, while the air in the hold and in the tweendeck moves in the reverse direction.

This solution to the problem of how to "recirculate" was by no means immediately apparent, as early attempts to recirculate the air illustrate.

Ventilation Alternatives

To provide the alternatives of (*a*) direct ventilation when the dewpoint of the atmosphere is lower than that within the cargo spaces, or (*b*) recirculation of the air within watertight bulkheads when the reverse conditions hold good, appropriate arrangements must be made. Current practice is to make two openings side by side in the deck. The duct system leads away from one; the other is known as the "Recirculation" opening. A fan-and-damper house is welded to the deck over these two openings, and access to each is kept separate by a vertical division in the fan-and-damper house. The fan is mounted above the ducting which supplies or exhausts air to or from the holds. The movement of a damper from one position to another in the fan-and-damper house opens access to either the atmosphere or the tweendeck, and so permits ventilation with outside air or recirculation of the air in the holds. The dampers to supply and exhaust duct systems serving one set of compartments must be worked together, and it is usual to group damper houses together in deck houses as far as possible.

Dehumidification Process

The use of dry air in ships is now no longer new. The word "Dehumidification" has been adopted to describe its use for the purpose of keeping the inside of a ship dry. For this reason, the expression "Ventilation and Dehumidification" is used to describe such systems and so to distinguish them from those using fan ventilation only. Thus, the American Bureau makes a notation in the register reading "V.D.S." to indicate the adoption of a system using "Ventilation and Dehumidification" in a cargo vessel.

Dehumidification, as a process,

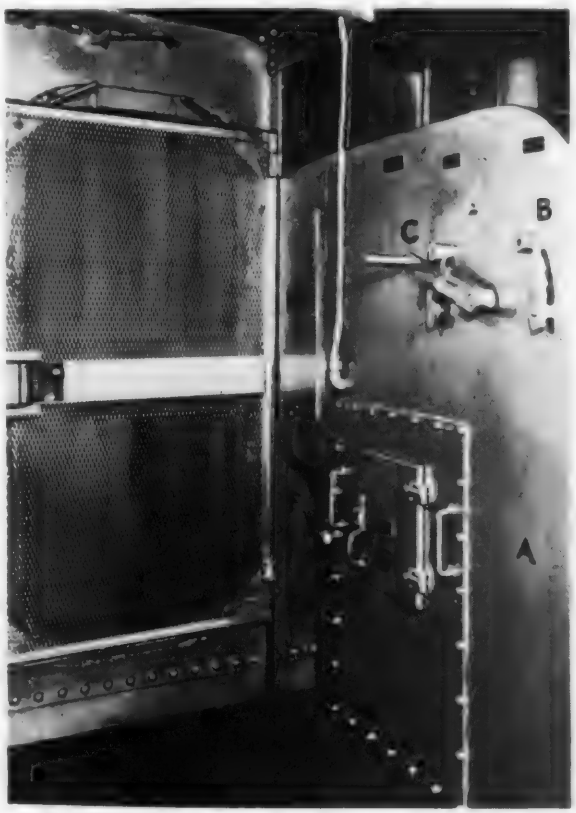


Fig. 3. Supply fan housing. A: Recirculation duct. B: Recirculation position of damper operating lever. C: Ventilation position of damper operating lever. D: Supply duct from atmosphere. E: Dry air supply duct. F: Dry air control damper. G: Supply fan access door.

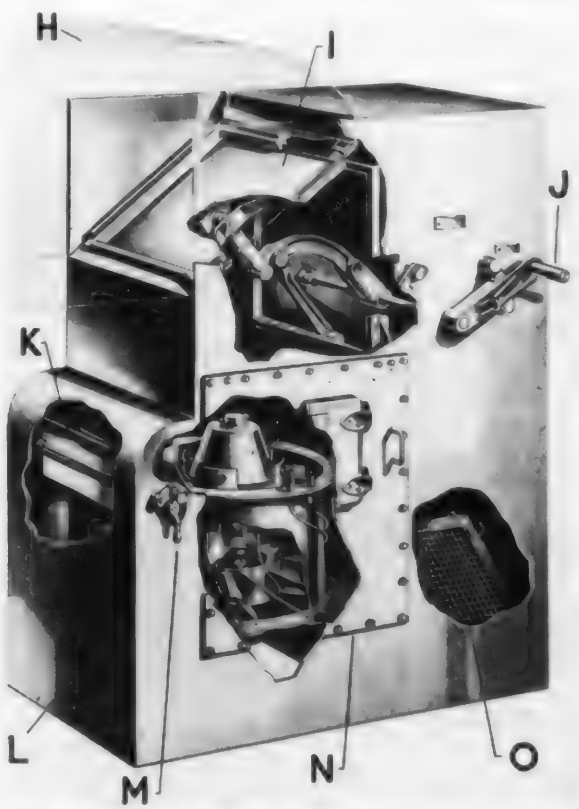


Fig. 4. Diagram of supply fan and damper house. H: Intake trunk. I: Damper in the recirculation position. J: Damper handle. K: Dry air damper. L: Dry air connexion. M: Dry air damper handle. N: Fan access plate. O: Recirculation opening.

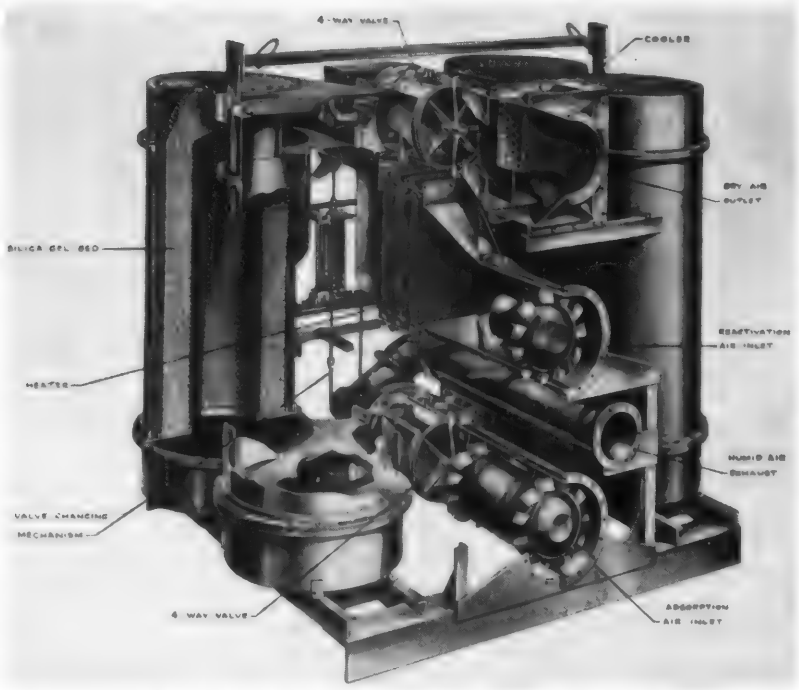


Fig. 5. Diagram of air drying machine, using silica gel as the drying medium, introduced in 1946.

has been applied most successfully in laying up warships, where, once the preparations have been made and the initial stage of drying completed, the operation of a small automatic drier using a solid absorbent for as short a period as an hour a day, is sufficient to hold the relative humidity of the air in the interior of the ship between 27 and 30 per cent. of saturation indefinitely. This preserves the whole of the interior of the ship and its equipment in a sound state.

Silica Gel as Drying Medium

Vessels at sea carrying general cargo require much larger machines. Pioneer installations using silica gel were in use at sea for this purpose in 1939. Upwards of one hundred vessels have been equipped with a model introduced in 1941.

Fig. 5 illustrates a model introduced in 1946, using silica gel as the drying medium. Approximately 50 ships use this machine for producing dry air, making a total of 150 ships using silica gel driers.

A further nine ships have adopted a drying machine based on the use of lithium chloride, which was developed about 1944 as a competitor to the silica gel drier.

The method of introducing the dry air into the ventilating system is through a welded duct, usually carried alongside a girder under the deck-head and passing through the bulkheads. It is at first a foot in diameter, but diminishes in cross section as branches are taken to the five or six supply points on deck, where the dry air enters the ventilating system on the suction side of each supply fan (see Fig. 1).

Instead of placing the drying units on an upper deck in the engine room, which is the usual practice, it has sometimes proved an advantage to locate one unit in a forward mast-house to supply air of low dewpoint to the forward holds and a second in an after mast-house to supply the after holds. This diminishes the length of dry air ducting required to reach the supply points.

Dewpoint Measurement

The dry air is used when the dewpoint of the atmosphere is higher than that in any particular hold. It becomes the duty of one of the deck officers to ascertain the dewpoint of the air issuing from each exhaust once daily and to compare it with the dewpoint of the atmosphere. Suitable instruments are provided for this purpose, one at each exhaust and one usually on the bridge. When the dewpoint of the air on the bridge is higher than that of the air issuing from any particular hold, the dampers are set to recirculate the air within the respective watertight bulkheads. It is then that dry air must be added, so that moisture given off from cargo has less chance of condensing on the ship's steelwork. This also ensures that fresh air is continuously added to the hold.

The damper in the exhaust fan house is left partially open so that an equal amount of air may escape from the hold. Dry air is also used when there is a likelihood of moisture from cargo condensing under the weather-deck through a fall in the atmospheric temperature, even although the atmosphere is sufficiently dry for direct ventilation.

Adaptation of Refrigeration

In Great Britain, it was inevitable that the process of cooling should be adapted sooner or later to the purpose of drying air, once the practice of providing dry air to ships' holds had been established. So many ships already have refrigerating machinery on board, that the use of brine pipes to remove the water from the humid air at sea required no inventive step. It was used for such purposes soon after the Brownheart case, about 1928, to remove the moisture from the air necessary to ventilate apple cargoes carried in ships equipped with brine grids. Without some such device, the direct ventilation of apples carried at 35° with sea air resulted in condensation of moisture on the fruit, with consequent rotting.

The adaptation of refrigeration to air drying for cargo-hold dehumidification has made headway. Twenty-eight ships (including those under construction) incorporate a system of ventilation using air dried by refrigeration. The installations are similar in many essential respects to those already described. They provide for the ventilation of the cargo

space by outside air as long as it is drier than the air in the hold. They recirculate the air through recirculation openings in the deck when the reverse conditions obtain. They employ the same criterion to determine whether to ventilate or to recirculate the air in the holds—that is, they measure the dewpoint of the atmosphere and compare it with the dewpoint of the air leaving the hold.

Employment of Brine Grids

In two respects that may be material, the installations employing brine grids differ from those already described. The drying unit, consisting of a brine cooler, is located alongside the fan-and-damper house on deck. The air to be dried comes from the hold. When the dampers are arranged to recirculate the air, part is diverted over the cooler and rejoins the main stream after it has had the major part of its moisture removed as liquid water. The other difference is that a single reversible fan is, in general, used to supply or exhaust air between watertight bulkheads, the opening at the other end of the hold forming a natural intake or exhaust.

Instrumentation Research

These new departures in ship ventilation have led to a search for suitable instruments to measure the dewpoint. An ingenious device has recently been patented to indicate to the operator by the position of a pointer on a dial whether to ventilate or to recirculate. The dial, under the influence of an element sensitive to dewpoint only, rotates in a clockwise direction as the atmospheric dewpoint rises. The pointer also rotates in a clockwise direction as the dewpoint of the hold atmosphere rises. If the pointer comes to rest in the section of the dial marked "Ventilate," this means that the cargo space dewpoint is higher than the atmospheric dewpoint, since the pointer has moved further clockwise and is therefore registering a higher dewpoint, while, *vice versa*, if the atmospheric dewpoint is higher than that of the cargo space, the dial will be rotated clockwise to a greater degree than the pointer and the pointer will therefore rest in the section marked "Recirculate."

Modern systems of ventilation which combine means of introducing dry air with mechanical circulation are designed for general merchandise, but they are also adaptable to the carriage of many special cargoes. A full cargo of wheat, for instance, loaded in a cool ship requires very little ventilation. Ventilation ducts should be blanked off except where there are sizable unoccupied spaces above the cargo. These should be ventilated. It should hardly ever be necessary to use dry air with such a cargo. With maize cargoes, which are damper, the same blanking off of ventilation to the lower holds is to be recommended, but the use of ventilation in the unoccupied open spaces above the grain is necessary and the addition of dry air may often be an advantage.

Fruit Transport

Fruit cargoes are ideally carried in insulated and refrigerated compartments, but there are many fruit trades in which mechanical ventilation and the cooling effect of sea-water on the ship's hull are depended upon for good out-turns. The condition of the fruit is governed throughout by temperature.

As with most new advances in ship construction, in ships' engines, and in ships' auxiliaries, the testing time is long. These new methods of ventilation are now going through such a period. Meanwhile, thirty owners, including many of the best-known companies in the world, are operating ships equipped with the systems described in this article.

Gums and Resins

LARGE quantities of both resins and gums have been used for many years in manufacturing processes of various kinds, and their use is continuing to increase. The world trade in natural resins has been estimated to be in excess of three-quarters of a million tons per annum. The value of the yearly import of gum arabic into Great Britain alone in normal times has commonly been in excess of a quarter of a million pounds sterling. A book* that covers this vast subject has been written by Dr. F. N. Howes, Principal Scientific Officer, Royal Botanic Gardens, Kew.

The number of plant species that yield gums or resins in greater or less amount throughout the vegetable kingdom must be many thousands. For this reason the author has placed emphasis on those gums and resins that are of commercial importance, or which, for some reason, are of special interest. He has given particular attention to those which have become of importance only in comparatively recent years and which are not dealt with in older works of reference. Examples of these are carob seed or locust gum, karaya or sterculia gum, and other tragacanth substitutes, also certain acacias, now known to be exploited for gum, particularly in East Africa.

The book is divided into two parts. Part I starts with a chapter on the nature and use of gums generally, followed by chapters on gum arabic and other acacia gums; gum tragacanth and similar gums; some well-known or much used Asiatic gums; gums of the New World; and miscellaneous or little-known gums, of which sixty-seven different kinds are mentioned.

Part II is devoted to resins, and the chapters treat of their properties and uses; the copals; rosin or colophony; dammars; kauri resin; lac resin and shellac; some little-used varnish resins, elemi; natural lacquers; frankincense and myrrh; and medicinal and other resins.

* *Vegetable Gums and Resins.* By F. N. Howes, D.Sc. Pp. 188+xx. Chronica Botanica Company, Waltham, Mass. and Wm. Dawson and Sons, London. Price 40s.

The Labelling of Food Order

THOMAS McLACHLAN, A.C.G.F.C., F.R.I.C.

In the House of Commons on October 17, Mr. Boyd-Carpenter, hon. Member for Kingston-on-Thames, moved that an humble Address be presented to His Majesty, praying that the Labelling of Food Order, (S.I. 1950, No. 1061), should be annulled. In view of the publicity given to the Debate which followed, it is here reviewed from the point of view of one who is called upon to assist in its administration.

IT is my considered opinion that the Law Court is the last place to which appeal should have to be made for a decision regarding the composition of a food. To quote the absurd position to which we have been reduced in this direction it is only necessary to remember that the High Court has decided that "artificial vinegar" must contain not less than 4 per cent. of acetic acid in one case, and that there is no such thing as artificial vinegar in another.

There are those who may or may not approve of many of the provisions of the Labelling of Food Order, and who may or may not believe that administration should ever be accomplished by Statutory Instruments, but they are entitled to feel that the discussion on a matter of greater or less importance to the people should be free from party politics as far as is humanly possible. Those who now see fit to condemn sundry provisions of the Order must accept a considerable amount of the responsibility for its birth.

Objections to the Order

The Explanatory Note given at the end of the Order does not perhaps summarise the whole of the changes introduced into the Order, and there may not be agreement with many of the introductions or articles carried forward from the previous Order, yet there is some feeling that the attack made on the Order itself was unfair, seeing that statutory documents are drafted by permanent staff and not by politicians.

I do not approve of the definition of "flavouring" given in the Order, not because it is "too chaotic," to quote the words used during the Debate, but because it allows too many manufacturers to evade the spirit of the definition and will result in actions in Court to prevent evasion. Only recently I have met cases of flavours giving no declaration of contents, even though they contained added dyes. I object to the fact that substances may be added to flavourings to produce them in a solid state. What a splendid opportunity to try to evade the Mineral Oil in Food Order!

Loopholes in the Legislation

No effort was, however, made during the Debate to bring out such a point. Mr. Boyd-Carpenter claimed that the wording should be such that it could be understood by those who trade in food as well as by lawyers. It would appear that lawyers look quite frequently for loopholes in legislation, and it is to be regretted that certain legal-minded people do quite a good business in following such an occupation. Near-Beer was sold because of a successful loophole being found in the Finance Act and in the Soft Drinks Order, with the result that the latter Order had to be amended. It has been said that anyone can drive a carriage and pair through any law, and it would be preferable to hear arguments in Parliament pursued with a better intention of preventing such an infringement of the Transport Board's preserves.

Modification of Articles

Objection was also taken by Mr. Boyd-Carpenter to Article 12, formerly Article 13, regarding a proviso for compliance with other Orders, on the grounds that everything should be included in the one Order. It may be asked whether the articles of the Preservatives, etc., in Food Regulations, should be deleted from that Order and interposed into the Labelling of Food Order and, if so, whether those poor souls who want to add preservatives should be forced to study two Statutory Instruments dealing with the one point. The hon. Member raised the question of the sale of Champagne Cider under Article 4 (e), but if my reading of this article is correct, there is nothing in the Order to prevent cider, which has undergone a genuine secondary fermentation, from being styled Champagne Cider; the prohibition applies only to an artificially aerated product.

Similarly Article 8, modified from the second part of the previous Article 8, and Article 9, taken word for word from the previous Article 9, provide for reasonable methods of defence and prevent the necessity for dragging law-abiding citizens before the Courts for offences, real or imagined, for which they are not in the least responsible. These articles were described by Mr. Boyd-Carpenter as being contrary to the principles of our English criminal law before this type of legislation came into force.

Availability of Defences

The answer is provided by Section 3 of the Food and Drugs Act, 1938, regarding the prohibition of sale of any food or drug which is not of the nature, substance, or quality demanded; this is followed by a fourth Section, which provides the defences available and which requires three times as much space as the earlier one. It may also be asked whether the hon. Member is in favour of Section 83 of the Food and Drugs Act and, if so, how he would suggest that action be taken

against the prime offender unless such defences are available.

Another instance of loose language, this time on the part of Sir John Mellor, hon. Member for Sutton Coldfield, concerned the objection to Explanatory Note (k) which reads after the opening: "Certain new provisions have been introduced, the principal ones being:

> (*k*) to permit nuts and synthetic cream to be designated as such when forming an ingredient of some other food; fish to be designated as such when forming an ingredient of a fish product, and vine fruits to be designated as such when forming an ingredient of some other food than a beverage (Item 3 of Table A of the First Schedule)."

Quite frankly, I cannot see that a reasonable man must, as suggested in the Debate, look back to find out what this really means. I should have agreed wholeheartedly with Sir John if he had objected to this provision in the Order. I object to buying Christmas pudding containing peanuts with the caption "nuts," where I expect almonds. I object to the inclusion of "vine fruits," which means I may find superfluous grapes, unsuitable for or in excess of the ordinary market requirements, where I expect to find a more or less equal weight mixture of raisins, sultanas, and currants. These would, of course, contain less water and therefore come lower in the scale of ingredients. I object to the description "fish" when I buy fish cakes if I find that herring have been used instead of white fish.

M.O.F. Exonerated from Liability

That the hon. Member for Huntingdon, Mr. Renton, hoped that the agony of the traders and of their legal advisers would be spared in the interpretation of the Order, is cause for some amusement, but does the said legal adviser really hope to be spared the necessity and opportunity of raising a legal quibble in such interpretation?

The only logical objection raised—one with which every private importer and manufacturer will agree—is that which exonerates the Ministry of Food from any liability for its purchases from abroad (Article 13). I suggest that, although this is an article carried forward word for word from the previous Order, it is one which should never have been allowed and which should have been fought tooth and nail by the food industry. To a layman it seems fantastic that it is possible to buy spices containing excess lead from a Government Department and then be prosecuted for the offence; that a Government Department may buy badly canned fish and sell it so that some unfortunate shopkeeper may have it thrown back on him after what would normally be ordinary shelf life.

On the whole the new Order will be welcomed, but it would be a tremendous advantage to all if British food law could be drawn up more on the lines of Canadian law. As one who loves and admires loose leaf systems, I would welcome the introduction of a comprehensive Act containing numerous Sections, which could be revised individually from time to time, followed by the names of foods or groups of foods with the individual limits, if any, to which they must conform, together with references to the various Sections of the Act to which they should also be liable. Or would this be just another lawyers' paradise?

Spices as Antioxidants

SPICES are commonly added to oils, particularly in the East, and while one of the factors which has led to the establishment and consolidation of this practice is the attractiveness of the taste of the spices, other and more utilitarian considerations may have contributed to the growth of this age-old custom.

A way in which the keeping qualities of oils and fats can be improved is by the addition of an antioxidant. Some extremely interesting work just reported by Sethi and Aggarwal* from the National Chemical Laboratory of India at Poona has shown that the condiments and spices that "from very early times in India it has been customary to add to edible fats, especially rendered butterfat (ghee)" have a pronounced antioxidative action; these spices are natural antioxidants and improve the keeping quality of the fats and oils to which they are added.

Tests were carried out on an arachis oil which was heated (with and without spices) to 275°-280° C., then cooled and filtered. The oils were examined for peroxide value and for acid value. Low values are indicative of slow absorption of oxygen, and therefore of good keeping qualities. Some of the experimental results are given in the Table.

Similar tests with cinnamon bark, dry ginger, green ginger, turmeric, nutmeg fruit, nutmeg mace, black pepper, and onions gave similar degrees of improvement. Based on the results of Sethi and Aggarwal, a comparison can be made of the antioxidative values of different spices and condiments. In the following list the first-named have the highest values: red chillies, cinnamon leaves, turmeric, dry ginger, black pepper, nutmeg fruit, nutmeg mace, cloves, cinnamon bark, green chillies, green ginger, and onions.

* S. C. Sethi and J. S. Aggarwal, *Nature*, 1950, **166**, 518-9.

Spice Added.	*Quantity Percentage on wt. of Oil.*	*Peroxide Value.*	*Acid Value.*
None (control)	—	76·9	0·99
Green chillies	2·0	16·1	0·54
	3·0	13·8	0·50
	5·0	11·8	0·43
Red chillies	0·5	23·4	0·58
	1·0	12·5	0·47
	1·5	7·1	0·44
Cloves	0·5	66·7	0·70
	1·0	16·4	0·55
	1·5	15·7	0·49
Cinnamon leaves	0·5	12·8	0·52
	1·0	8·5	0·51
	1·5	7·5	0·50

A Puzzle for Mycologists

THE Cellar Mould, which should not be confused with the Cellar Fungus (the popular name of *Coniophora cerebella*, a timber-destroying fungus often found on woodwork in damp cellars), is that curious fungus which grows in such abundance in wine cellars and vaults. Often it develops in such quantities that roofs, walls, and pillars are festooned with masses of sticky white cotton-wool, darkening with age until nearly black.

The organism was for a long time something of a puzzle to mycologists, and was classed as *Rhacodium cellare* among the fungi not known to form spores. More recent work by Schanderl* has shown that spores are formed in culture, and the fungus is now placed in the genus *Cladosporium*, which includes the well-known *Cladosporium herbarum*, a frequent cause of dark stains on everything from meat to textiles.

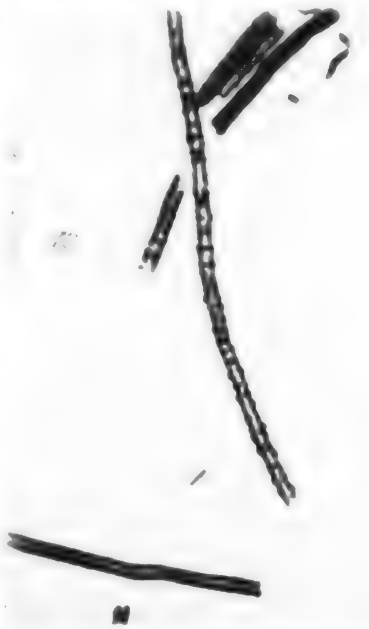
Biochemical Peculiarities

Cladosporium cellare (Persoon) Schanderl, to give it its full name, has many biochemical peculiarities. In particular, it requires no organic nourishment from its substratum; provided that the necessary traces of other elements are present in available form, the mould can obtain all its carbon from volatile substances present in the atmosphere of the wine cellar — alcohols, esters, aldehydes, and volatile acids.

This fact explains its ability to grow in such habitats and on such uncompromising substrata as brick or stone that will not support other organisms. It may also explain the old belief among cellarmen that the Cellar Mould "purifies the atmosphere." At any rate, the fungus does no harm; it has no mouldy odour and cannot grow on wine since it will not tolerate more than 3 per cent. of alcohol.

Another peculiarity is the warted appearance of the fungus filaments (mycelium), caused by the deposition of a wax-like substance. This is more marked in cellar growth than in the fungus grown on laboratory media; from the former, about 5 per cent. of waxy substance can be extracted by a solvent.

The Cellar Mould seems to be one of the very few fungi that has been overlooked in the great hunt for antibiotics, but the author has recently observed that this organism produces a substance active against gram positive bacteria.



Cellar Mould (×1,000) showing warty mycelium and characteristic breaking into short lengths. *Photo A. W. Rule.*

The active antibiotic can be extracted by chloroform, and precipitates on addition of excess acetone to give needle-shaped crystals of low solubility in water. The substance is heat-stable, contains no nitrogen, and has a melting point of something over 230° C. The presence of a zone of inhibition may also be shown around a colony of the fungus grown on agar in a Petri dish.

The Cellar Mould should repay further investigation. Admittedly the fungus is a somewhat slow grower in culture, but large quantities are available in the "natural" state and would form admirable research material.—L. D. GALLOWAY.

* Schanderl, H. (1936): *Zentr. f. Bakt.*, Abt. II, **94**, 112.

Fruit Research

COVERING the period from January 1 to September 30, 1949, the East Malling Research Station's Annual Report for its thirty-seventh year reviews, in section 1, the year on the farm, outlining the treatments and the crops produced. Drought conditions during the summer months resulted in poor size and quality of apples and pears. A good crop of cherries was produced and soft fruits were satisfactory.

Section 2 is devoted to a review of all aspects of the research in progress, and lists the publications that have been produced during the year.

Research reports and reviews, mainly written for scientific readers, occupy section 3, which includes the full text of the second Amos Memorial Lecture, which was given by Mr. B. S. Furneaux, on "The Soil and the Fruit Tree."

The articles in the fourth section cover the pruning of bush apples, the control of biennial bearing, the model gardens at Bradbourne, strawberry cultivation, propagation research, Brown Rot, diseases of hops, and fruit marketing.

Numerous text figures and twenty-three photographic plates illustrating the articles add to the value of the Report.

Our Contemporaries

THE malting process and the manner in which different types of barley are required for the production of malt for various purposes are discussed by A. Cory Wright in the November issue of *World Crops*. This is the second of a trilogy of articles devoted to the subject of barley and brewing. The first of the series by Dr. H. Hunter, and published in October, described the characteristics of barley suitable for malting and the progress made in developing improved types during recent years.

For the first time for many years, the demand for coffee is exceeding the supply. Some of the salient features of the present production position are reviewed in the November issue of *World Crops*.

Practical Jam Making

FOR some reason or another the literature on jam manufacture is exceedingly sparse; apparently technical writers have not been attracted by the subject. It is curious to note that even the *Encyclopaedia Britannica*, at any rate up to the 14th edition, does not bother to mention the word "jam" except in connexion with an Eastern title of nobility and a river in Persia.

In the general textbooks on food and in the periodical literature, the subject of jam is treated in a variety of ways, but in the preface of a new book,* the author says he does not know of any work which deals solely with the subject in a practical manner. This book tells the reader about jam making with a praiseworthy lack of verbiage. The first chapter goes straight to the point. Someone may want to start a jam factory or reorganise an existing one. Very well, says the author, and with no more ado, he tells exactly where it should be put. In the country, of course. There are snags, but the author points these out, although he might, with advantage, enlarge this section somewhat.

The site having been selected, the next things are buildings and layout. These are discussed in businesslike terms, accompanied by illustrations of layouts in actual jam factories, including some interesting American arrangements embodying vacuum boiling pans.

One chapter, devoted to a description of fresh fruits for jam manufacturers, tells of the best varieties for the purpose. While emphasising that every bit of fresh fruit should be made into jam, the author includes in this chapter a description of the pulping and preservation of fruit where this is necessary owing to the impossibility of processing all the crop during the short fruit season.

In another chapter, the author touches lightly upon the theoretical aspects of gel formation and the laws governing it, and thence to a practical discussion on pectin manufacture, its grading and use. The preparation of sugar and invert sugar syrups is well described and illustrated.

The essentially practical approach which characterises the book is maintained throughout. In the chapter on the control of jam manufacture, it is stated that "the maintenance of a stable quality of jam is one of the main problems of the modern jam manufacturer whether he is in a large or small way of business, but the problems of control are different." That is to say, the small man may not have the advantage of a well-equipped laboratory, thus making the maintenance of a stable quality of jam a difficult problem. The solution (states the author) is a balanced quality and production control—balanced because over-organised control systems in small factories usually defeat their own purpose, being a burden rather than a help. This subject is briefly but usefully discussed.

In other chapters are discussed the cooling and filling of jam and the factory laboratory; appendices containing thirty-two tables provide a mine of information.

Containing as it does a maximum amount of information in a minimum amount of space, this book should be read by all jam manufacturers, especially those working on a relatively small scale, who are looking for a clear exposition of their art.

* *Jam Manufacture*. By George H. Rauch. Pp. 201+viii. Leonard Hill, London. Price £1 net.

Conservation and Utilisation of Resources

THE primary concern of the United Nations Scientific Conference on the Conservation and Utilisation of Natural Resources (UNSCCUR), held at Lake Success during August and September, 1949, was with the practical application of science to resource management and use, rather than with refinements in research and scientific methology.

The complete proceedings of the Conference are being published. There will be a total of eight volumes: I. Plenary Meetings; II. Mineral Resources; III. Fuel and Energy Resources; IV. Water Resources; V. Forest Resources; VI. Land Resources; VII. Wild Life and Fish Resources; VIII. Index.

Volume I,* which contains the verbatim record of the discussions at the plenary meetings, as well as the full text of papers contributed, is now available. The main topics covered in the plenary meetings were: the world's resource situation (the legacy of resource depletion, the increasing pressure of resources); a world review of critical shortages (food, forests, minerals, fuels); the interdependence of resources (the complementary nature of European resources, the planning of land use for full production with special reference to European conditions); the use and conservation of resources (soil and forest conservation and protection of water supplies, techniques for increasing agricultural production, estimates of undiscovered oil and gas reserves, economics of competitive fuels for various purposes and their use to meet future fuel requirements, metals in relation to living standards); the development of new resources by applied technology (fodder yeast and algae, the contribution of chemurgy, wood fibre, food yeast, fat synthesis by micro-organisms and its possible application in the food industry); methods of resource appraisal; the adaptation of resource programmes; assessing resources in relation to industrialisation plans; education for conservation; resource techniques for less-developed countries; integrated development of river basins.

The complete set of UNSCCUR proceedings will constitute a unique collection of scientific knowledge and thought, and should be of lasting value to industry, research, and development.

* *United Nations Scientific Conference on the Conservation and Utilisation of Resources*. Volume I, Plenary Meetings. U.N. Publ. Sales No. 1950, II.B.2. Pp. 431+lxi. H.M.S.O., London. Price: (U.S.) $4.50; 32s. 6d. sterling; 18.00 Swiss francs; or equivalent in other national currencies.

Meat Preservation by Antibiotics

The use of antibiotics innocuous to the human organism has interesting possibilities and the subject has recently received considerable attention on the part of research chemists, especially in the U.S.A. Elsa Hounie of the Bacteriological Section of the Massone Institute, Buenos Aires, has carried out some investigations with a view to studying the effect of penicillin, streptomycin, tyrocidine, subtilin, and chloramphenicol on meats destined for canning.

THE meat for experiment was obtained from recently killed animals without any special precautions to ensure sterility. As a result of bacteriological examination, the micro-organisms contaminating the surface of the meat were found to be principally *Staph. albus*, *E. coli*, *B. subtilis*, *Cl. perfringens*, and *Cl. oedematiens*. The presence of these micro-organisms arose from accidental contamination during handling; therefore their distribution was irregular from one part of the meat to the other, and in order to obtain comparable results, the meat was experimentally contaminated with the bacterial species most commonly found so that each sample had identical bacterial content.

Technique Employed

Samples of meat weighing 4 g. were inoculated with approximately 15 million micro-organisms of each species. Other samples were inoculated with from 200 to 1,000 million micro-organisms of each species. Under these conditions, which were more severe than in ordinary practice, high temperatures were needed to ensure sterilisation.

The object of these experiments was to examine the possibility of impeding the growth of anaerobic microbes which are most resistant to any chemical agent and especially to the action of antibiotics.

The samples of meat were placed in sterile test tubes to which was then added 1 ml. of liquid containing the cultures of the micro-organisms in suspension. After twenty minutes, 0·2 ml. of solution of the antibiotic selected for the experiment was then added, and anaerobic conditions were obtained by forming a cap of a mixture of sterilised paraffin on the surface. The growth of some of the micro-organisms was demonstrated by the production of gases which raised the layer of paraffin proportionately to the intensity of growth. At the end of the experiment a count of the number of germs in each tube was made.

Tests with Subtilin

The agent which promised most success was subtilin—a substance extracted from cultures of *B. subtilis*, and which in previous experiments had demonstrated notable bacteriostatic and bactericidal properties, even with the spores of some *Clostridia* (*perfringens*, *oedematiens*, etc.). It was established that *in vitro* in Hitchen's medium (glucose broth with agar at 1 per mil.) the subtilin inhibits the development of such anaerobes up to a dilution of 1:2,000,000. But considering that in contact with the tissue of muscle the micro-organisms might be more protected, the dilutions employed were in the region of 1:200,000 and 1:1,000,000, that is to say, smaller dilutions capable of more energetic action. Table I shows the results.

Action of the Antibiotic

The antibiotic retarded but did not inhibit bacterial growth; after five days there was no difference between the growth of the bacteria in the tubes containing antibiotic and that of the control which did not contain it.

Modification of Technique

These results were ascribed to the fact that the antibiotic did not come into contact with the bacteria which were contained on the surface of the sample. The experiments were therefore repeated with a small variation in technique. Instead of leaving the tubes with the inoculated meat at 20° C. after having added the subtilin, they were left for five days at 5° C. At this temperature, bacterial growth was absent, but the subtilin had penetrated in the muscular tissue to a depth of approximately 0·5 to 0·7 cm. The extent of penetration was found by measuring the antibiotic power of the extracts of the most superficial tissues of the sample under test; in the deeper tissues it was nil.

After the period of diffusion of the antibiotic, the tubes were heated to 20° C. and were kept under observation at this temperature for ten days. In Table II are shown the results obtained. These experiments had for their principal object the study of the destruction of anaerobic micro-organisms, and excluding contaminating organisms such as *E. coli*, etc.

These tests showed that, by producing conditions that favoured the penetration of the antibiotic, at the same time avoiding the growth of bacteria by the use of low temperature, the meat was better preserved, even after it was heated to air temperature.

Tests with Other Antibiotics

Having established the best technique by means of the preliminary tests, the behaviour of other antibiotics was studied. In

TABLE I

Nature of contamination.	*Concentration of the antibiotic.*	*Growth of bacteria and production of gases after:*		
		24 hours at 20° C.	*48 hours at 20° C.*	*5 days at 20° C.*
Cl. perfringens	1:200,000	−	− +	+ +
E. coli	1:1,000,000	−	+	+ +
Control	0	+	+ +	+ +

TABLE II

(*a*) Tests made in tubes at 20° C.

Contaminating organisms.	*Concentration of the antibiotic.* 1 : 100,000		1 : 500,000		0 (*control*)	
	Growth of bacteria and production of gases after: 2 days.	10 days.	2 days.	10 days.	2 days.	10 days.
Cl. perfringens ..	–	+	+	+ +	+ +	+ +
Cl. perfringens ..	–	+	+	+ +	+ +	+ +
Cl. septicum ..	–	+	– +	+ –	+ +	+ +

(*b*) Tests made in tubes at 5° C. for 5 days and subsequently at 20° C. for 10 days.

Cl. septicum ..	–	–	–	–	+ +	+ +
Cl. oedematiens	–	– +	–	– +	+ +	+ +
Cl. oedematiens	–	–	–	–	+ +	+ +

Table III are given results obtained with antibiotics which were found to be most active. Chloramphenicol and tyrocidine were least efficacious. Tyrocidine, while being especially active against certain pathogenic micro-organisms, is not so towards anaerobes, and the application of chloramphenicol, apart from its being found somewhat inferior to the streptomycin, seems to be excluded by reason of its high price.

Conclusions

From these results it was deduced that:

1. Subtilin and penicillin separately, although appreciably inhibiting bacterial growth and production of gas, do not destroy contaminating organisms. The bacteriological controls revealed that the production of gas was due in part to *E. coli* which, in spite of anaerobic conditions, showed some growth after five to six days at 20° C. The conditions thus produced favoured in their turn the growth of the *Clostridia* which had survived the action of the antibiotic. Penicillin permits a major growth of micro-organisms, while subtilin has a most powerful bactericidal action.

2. Streptomycin, notwithstanding its action on gram positive and gram negative micro-organisms, is not effective because it does not sufficiently inhibit the growth of the anaerobes.

3. A mixture of subtilin and penicillin does not give better results than these two substances used separately.

4. A mixture of penicillin and streptomycin gives satisfactory results, although at times it was found not to inhibit completely the growth of certain anaerobes, which multiply rapidly.

5. A mixture of subtilin and streptomycin, according to the experiments, is the most satisfactory inhibitor of the growth of micro-organisms contaminating meats. Prolonging for fifteen days the period of observation, large reduction of the number of micro-organisms, amounting in some cases to complete sterilisation of the medium, was noted.

Abstracted from Farmalecta, Buenos Aires.

TABLE III

Antibiotic employed.	*Meats inoculated with. Cl. perfringens, E. coli, Staph. albus, B. subtilis.*		*Meats inoculated with: Cl. oedematiens, E. coli, Staph. albus, B. subtilis.*	
	The growth of bacteria and production of gas at the end of 5 days at 50° C. and after:			
	2 days at 20° C.	*10 days at 20° C.*	*2 days at 20° C.*	*10 days at 20° C.*
Subtilin 1 : 200,000	–	– +	–	– +
Penicillin 0·1 U./cm.³	–	– +	–	– +
Streptomycin 1 : 200,000	– +	+ +	–	– +
Subtilin 1 : 200,000 with penicillin 0·1 U./cm.³	–	– +	–	– +
Subtilin 1 : 200,000 with streptomycin 1 : 200,000	–	–	–	–
Penicillin 0·1 U./cm.³ with streptomycin 1 : 200,000	–	– +	–	–
Control	+ +	+ +	+ +	+ +

Correspondence

To the Editor of
FOOD MANUFACTURE

The Vinegar Puzzle

DEAR SIR,—Forty-five years ago, my firm introduced "Unfermented Vinegar," thus definitely distinguishing it from vinegar produced by double fermentation. Moreover, malt vinegar has no greater claim to the term "vinegar"—not being a "sour wine"—than synthetic acetic produced by the destructive distillation of wood.

Surely adequate evidence was not produced before the London magistrate to clear the air, or such a strange decision, with such far-reaching consequences, would never have been arrived at.

The only *real* difference between synthetic and malt vinegars is the malt extractives, which give distinctive flavours; but these have the disadvantage of being liable to encourage the formation of animalculae known as vinegar eels when exposed to the air, a disadvantage not possessed by synthetic vinegar.

Yours faithfully,
GEO. REEVE.

London.

Preservation of Apples

FULL details of the construction and working of a gas store, which increases the storage life of apples at any given temperature by about two-thirds compared with storage in air, are given in a revised edition* of a Food Investigation Leaflet.

The gas used, carbon dioxide, is a product of the apples themselves, which "breathe" in approximately the same way as animals. As well as retarding ripening, it has the property of preserving, almost unchanged, the firmness of the fruit. Gas-stored apples have a long life after removal from the store, an important point for the distributor and consumer.

* *Food Investigation Leaflet No. 6, "Refrigerated Gas Storage of Apples."* Published for D.S.I.R. by H.M.S.O. Pp. 16. Price 6d.

News from the Industry

FORTHCOMING EVENTS

Society of Chemical Industry

The following meetings have been arranged for the first part of the 1951 programme of the Food Group of the Society of Chemical Industry:

Jan. 10. Microbiological Panel meeting, jointly with the Society for Applied Bacteriology. The Cytology of Bacteria. "New Observations on the Structure of Bacterial Spores," Dr. C. Robinow; "The Cytology of the Filamentous Bacteria," Mr. E. O. Morris; "Application of Electron Microscopy to the Study of Cytology," Dr. V. E. Cosslett; "Cytology in Relation to the Evolution and Classification of Bacteria," Dr. K. A. Bisset. Prof. R. J. V. Pulvertaft will open the discussion.

Jan. 15. Joint meeting with the Liverpool Section. The Marine Transport of Food. "Cereals," Dr. J. Sword; "Fruit," Dr. J. C. Fidler. Interval for tea. "Meat," Dr. E. H. Callow and Dr. R. Gane. Details of the fourth paper will be announced later.

Jan. 17. Joint meeting with the London Section and the London and South Eastern Counties Section of the Royal Institute of Chemistry. "Some Oxidase Systems in Flour," Prof. H. Burton.

Jan. 24. Nutrition Panel meeting. Factors in Distribution Affecting the Quality and Nutritional Value of Foodstuffs. Third meeting of the series—"Fats and Fatty Foods."

Feb. 28. Domestic meeting. "Radioactive Tracer Studies on the Fate of Insecticides," Mr. F. P. W. Winteringham.

Mar. 8. Annual dinner-dance.

Mar. 14. Microbiological Panel joint meeting with the Newcastle Section and the Royal Microscopical Society. "Yeast in the Service of Man," Mr. H. van Gruisen. Details of two other papers to be announced later.

Mar. 28. Nutrition Panel meeting. Factors in Distribution Affecting the Quality and Nutritional Value of Foodstuffs. Fourth meeting of the series—"Fruits and Vegetables."

Forthcoming meetings of the Agriculture Group of the Society are as follows:

Jan. 16. Crop Protection Panel. "Plant Growth-regulating Activity in the Aryloxyaliphatic Acids," Prof. R. L. Wain.

Jan. 25. Joint meeting with the South Western Section. Subject to be announced. Speaker, Brynmor Thomas.

Feb. 20. "Sugar Beet Production," Dr. A. Carruthers.

Mar. 6. Crop Protection Panel. "Some Recent Developments in the Field of Agricultural Fungicides," R. W. Marsh.

Mar. 20. "Agricultural By-products and their Industrial Utilisation," Dr. F. N. Woodward.

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Royal Society of Arts

Among the meetings arranged for the 197th session of the Royal Society of Arts are the following:

Ordinary Meetings

Dec. 13. "Modern Trends in Spectroscopy," A. C. Menzies, M.A., D.Sc., controller of research, Hilger and Watts.

Jan. 10. "Insecticides and their Study," C. Potter, D.Sc., Ph.D., D.I.C., head of the Department of Insecticides and Fungicides, Rothamsted Experimental Station.

Jan. 17. "1851-1951: A Century of British Industry," Right Hon. Lord McGowan, K.B.E., chairman of I.C.I.

Jan. 24. "Dry-rot and Timber," W. P. K. Findlay, D.Sc., D.I.C., officer-in-charge, Mycology Section, Forest Products Research Laboratory, D.S.I.R.

Jan. 31. "1851-1951: A Century of British Commerce," A. de V. Leigh, M.B.E., M.A., secretary, London Chamber of Commerce.

Feb. 7. "Recent Research on Bees and Beekeeping," Stanley Gooding, M.A., M.Sc., M.D., chairman, research committee, British Beekeepers' Association.

Feb. 14. "1851-1951: A Century of British Science," D. McKie, D.Sc., Ph.D., reader, Department of the History and Philosophy of Science, University College, London.

India, Pakistan, and Burma Section

Feb. 8. "Some Agricultural Problems of Pakistan," S. J. Wright, M.A., agricultural adviser to the Ford Motor Company.

Dominions and Colonies Section

Jan. 30. "The Contribution of the Colonial Empire to World Food Supplies," G. F. Clay, C.M.G., O.B.E., M.C., agricultural adviser to the Secretary of State for the Colonies. The Right Hon. A. Creech Jones, P.C., lately Secretary of State for the Colonies, in the chair.

Mar. 15. "Physical Science's Contribution to Australian Industrial Development," A. D. Ross, C.B.E., M.A., D.Sc., professor of physics, University of Western Australia.

Food Factory Conversions

Originally built and for some years run as an ice rink, before being converted into a cinema, The Majestic, Botley Road, Oxford, has been sold to Frank Cooper, Ltd., Oxford, who intend to convert the property into a factory for the manufacture of preserves.

In addition to the main cinema building, the property includes a large power house and a subsidiary building which was intended for use as a ballroom, with a manager's house attached.

Another instance of a complete change of operations is in a factory in Scotland which was once turning out oilskins, but which is now being used by Anstruther Food Products for the manufacture of potato crisps, initially for the East and Central Scotland area.

Purchasing Officers' Association

At the annual conference of the Purchasing Officers' Association recently held in Brighton, Mr. D. Wragg, the retiring National Chairman, reported the substantial progress which the Association had made during the year 1949/50, both in its membership and its services.

He stated that the Association now had 30 branches and groups in the United Kingdom with over 2,300 members drawn from industrial and public undertakings. During the year the first of the Association's Commonwealth branches had been formed in Natal.

The chairman called upon all members to give particular support to the Association's education scheme, providing the means by which junior members of the purchasing profession could equip themselves for greater responsibilities. During the year under review the Association's final examination had, for the first time, been successfully taken by a number of students.

A new feature of the conference was the P.O.A. "Minibition," through which nearly 100 of the leading companies in the country, drawn from a wide industrial range, were able to exhibit their products.

At the conclusion of the conference, Mr. W. H. Napper and Mr. T. L. Garner were elected President and National Chairman respectively for the year 1950/51.

Refrigeration Equipment

A wide selection from the range of Prestcold refrigeration equipment including two cold rooms, one a 200 cu. ft. dairy type and the other a butcher's cold room, are to be shown by the Pressed Steel Company at the Smithfield Show from December 4 to 8.

Dearer Christmas Dinners

Judging by present indications, turkey meat will be dearer this Christmas. Buyers are seeking supplies at 4s. per lb., as against 3s. which was quoted at the same time last year.

In Scotland the turkey population has fallen from 188,500 in June, 1949, to 101,700 in the present year. This decrease can be attributed largely to the shortage of feedingstuffs; turkeys eat too much to be an economic proposition for most breeders at the present time, and this, coupled with the incidence of disease, accounts for the reduction in supplies.

The Story of Sugar

Those whose knowledge of sugar is confined to its appearance on the tea-table will be interested in a handy little book on sugar written in non-technical language by J. A. C. Hugill, and published by Cosmo Publications and Tate and Lyle.

The book, which appeared in its original form in 1936, was written to give a simple and readable story of sugar, and is eminently suitable for students and teachers in schools and colleges. Copiously illustrated and priced at 2s. 6d., it describes the production of raw beet sugar and the refining of both beet and cane sugar.

Manufacturing Bakers' Materials

Specialising in articles for the bakery and ice cream trade, A. L. Attwood and Co., produce importers, can offer fondant, sweetened fat, and Atcola chocolate cream filling.

The company have led the way in imports of various articles, emphasis being laid upon quality and packing. Their director is frequently abroad to improve both these essentials.

As they are in close touch with exporting countries, they welcome enquiries from the trade for materials needed for any particular line of product.

Mr. A. G. Pinch, of Thomas and Evans, City Bakery, Ely, near Cardiff, receives the Procea Gold Cup from Mr. S. A. Lancaster, managing director of Procea Products.

Bakers' Annual Conference

DINNER AND DANCE AT GROSVENOR HOUSE

Nine hundred bakers and their wives came from all parts of Britain to attend the fifth Annual Sales Conference dinner and dance of Procea Products held at Grosvenor House on October 18.

During the afternoon session which was held at the Waldorf Hotel, a complete range of Procea products, including the recently reintroduced fruit and brown loaves, was on show to the bakers, who were also able to examine the various sales aids which the company can offer them for their own window and counter displays. Other features were technical demonstrations of the effect of correct proving conditions on bread, and a display of laboratory equipment and an illuminated transport map which showed the routes followed by the company's fleet of delivery vehicles throughout the country.

Loaves for the Procea 1949/50 competition were judged by Dr. A. J. Amos, Ph.D., B.Sc., F.R.I.C., of Procea Products; Mr. W. E. Spencer, M.B.E., chief bread production officer, Ministry of Food, and chief test baker, Millers' Cereal Research Association, St. Albans; Mr. A. Clive Jones, of A. Jones and Sons, N. Finchley, who won the cup in 1948 and were runners-up in last year's competition; and Mr. R. C. Bartlett, Procea's head test baker.

At the dinner in the evening, the principal speakers were Mr. W. J. Brown, Mr. L. D. Gammans, M.P., Dr. D. W. Kent-Jones, Ph.D., B.Sc., F.R.I.C., and Alderman C. W. H. Hill. After dinner, the Procea Gold Cup, which is annually awarded in a nation-wide contest to the baker producing the best Procea loaf, was presented by Mr. S. A. Lancaster, managing director of Procea Products, to Thomas and Evans, Ltd., of Ely, near Cardiff. This was received on behalf of the company by Mr. A. G. Pinch. Other prizes to competing finalists were silver cups, and gold, silver, and bronze medals. After the presentations, the rest of the evening was devoted to dancing in which the large majority of the guests took part.

Factories to Fight Winter Ills

Managements of over 15,000 factories in England and Wales are being asked to display a new humorous poster as part of the Ministry of Health's campaign against the spread of colds and influenza, estimated to cost industry 40,000,000 man-days a year and tens of millions of pounds.

The new poster, which has been prepared by the Central Office of Information, shows how a fellow worker uses an overhead crane to get a handkerchief to a mate who is in the initial throes of a sneeze, before the final "explosion." The caption is "Coughs and sneezes spread diseases," with the exhortation: "Trap the germs in your handkerchief."

Television figures in another new cartoon poster for the campaign. Here the final picture shows an outsize handkerchief swathed round the TV set after the announcer has indulged in an uncontrolled sneeze.

Co-ordination in Baking Research

B.B.I.R.A. ANNUAL GENERAL MEETING

Co-ordination in their baking research was the keynote of the annual general meeting of the British Baking Industries Research Association, held recently at the Trocadero Restaurant, London. To emphasise this, an exhibition giving a cross-section of research problems being investigated, with a jig-saw display providing a pictorial representation of co-ordination as the centrepiece, was staged.

In moving the adoption of the Report of the Council for the year July 1, 1949, to June 30, 1950, Dr. R. T. Colgate, D.Sc., F.R.I.C., chairman, said that the programme, which covered problems connected with biscuits, bread, and cakes, was a blend of fundamental scientific and technical investigation. From the many small technical services or *ad hoc* enquiries which were made, larger problems emerged requiring fundamental research. He emphasised the increasing necessity for unified scientific representation on behalf of the industry on the committees of the various Ministries associating themselves with the operation of the baking industry. The Association was already represented on the Ministry of Food's Scientific Liaison Panel, on subcommittees discussing microbiological spoilage of butter, synthetic creams, albumen substitutes, etc., as well as on the Medical Research Council committee considering food additives, and this provided as strong a case for increasing membership as the need to support the Association's research work.

At the lunch which followed, Professor E. C. Dodds, M.V.O., D.Sc., M.D., one of the world's leading authorities on the nutritional aspects of flour extraction, described his work in connexion with the fortification of flour, a practice which was abandoned in Gt. Britain when the necessity for high extraction flour arose, but which is now carried out on a wide scale in America.

In the afternoon, members and their guests, who included eminent food scientists, gathered to hear Dr. J. B. M. Coppock, B.Sc., Ph.D., F.R.I.C., director of research, describe the work of the Association on the addition of fat and/or glyceryl monostearate to bread, and rancidity in biscuits, and he showed how the work of the test baker, the practical baker, the research chemist, and the physicist, had all been co-ordinated to achieve results. Everything they did, he said, was complementary—there was no line of demarcation between any particular study.

Members were then given an opportunity to discuss technical problems with the staff, and the proceedings concluded with the showing of a film strip dealing with hygiene.

Amos Memorial Lecture

The wider aspects of the fruit tree and its environment was the subject of the third Amos Memorial Lecture given by Sir Edward Salisbury, F.R.S., at Wye College on October 26 in the presence of over 300 visitors.

New Scottish Ice Cream Factory

Approval has been forthcoming from the Hamilton Dean of Guild Court for the construction of a modern ice cream manufacturing plant by the Eldorado Ice Cream Co. at Whistleberry Road, Hamilton, at a cost of some £120,000.

The proposed plant will be one of the largest and most modern in Scotland, and its development there will still further stimulate the competition existing in the Scottish ice cream trade.

Gelatine and Glue Research

Representatives of member firms, of other research associations, and of the D.S.I.R. were present at the second meeting of the research panel of The British Gelatine and Glue Research Association, held in London recently. The programme consisted of the reading of two papers and a visit to the Association's laboratories at 2/4 Dalmeny Avenue, Holloway, N.7, where members were able to see the newly completed modifications to the premises.

The first paper, entitled "The Composition of Hide and the Changes Produced by the Action of Alkalies," was given by Dr. J. H. Bowes of the British Leather Manufacturers' Research Association. Dr. Bowes discussed recent work on the amino acid composition of collagen, the interpretation of titration, the effect of alkaline treatment of collagen, and the swelling of collagen in alkaline solutions.

In the second paper, which was given by Mr. A. G. Ward, the director of research of the Association, on the subject "Recent Studies of High Polymers in Relation to the Properties of Gelatine and Glue," methods developed for the determination of molecular weights were reviewed and their applicability to gelatine and glue were considered. In addition theories of degradation of high polymers and the nature of rubberlike elasticity were described.

Food Products from Overseas

Fondant, a combination of sugar and liquid glucose, for use in sugar confectionery and bakery productions, fruit juice and syrups from the Continent and the East, as well as chocolate couverture and chocolate vermicelli, are offered to manufacturers of high-class products by the British and Western European Trading Co., general produce importers and merchants.

The increase in world prices for raw material has raised prices for these products, but owing to connexions with the actual overseas manufacturers, supplies can be had at competitive prices.

The company, who are affiliated to Portman, Hill and Co., export merchants and shippers, can also handle enquiries with regard to teaseed and other edible oils.

Concessions to Pig Producers

Following representations by the National Farmers' Union, the Ministry of Food have agreed that producers shall be informed when carcasses of uninsured casualty or emergency slaughter pigs sent to bacon factories are condemned. Producers will thus be able to contest condemnation.

The Ministry have instructed bacon factories to advise the producer immediately by telephone or telegram when uninsured pigs are condemned or partly condemned. Carcasses will be held for twenty-four hours after slaughter so that the producer may have an opportunity for inspection if he wishes.

Also at the request of the Union, the Ministry have now agreed to extend the scale of payments allowed to producers using their own transport for delivering pigs to bacon factories. The scale has been revised to provide for allowances up to 95 miles, and details have been sent to N.F.U. county branches.

The Industries of Coventry

A reliable, comprehensive, and convenient source of reference for information regarding the city's industries, the *Directory of Coventry Manufacturers*, published by the Corporation of Coventry Municipal Information Bureau, will remove many difficulties which at present hinder introductions and easy communication between manufacturers and prospective customers in the city and elsewhere.

Apart from the alphabetical list of manufacturers and products, the Directory gives a list of banks in the city, the London trade enquiry offices of the Dominions, Colonies, etc., Government and public offices in London, and foreign consuls in Birmingham.

Alloy Developments

Although specifically developed to meet the requirements of gas turbine designers for a blade material which, in addition to withstanding great stresses at high temperatures, would have good resistance to creep, Nimonic Alloys have a large number of other applications.

To assist in the correct choice of the most suitable grade for particular applications, the alloys have been reclassified, and Henry Wiggin and Co., the producers, have issued a leaflet which summarises the types available.

Data on the physical and mechanical properties of Nimonic 90, the latest addition to this series of alloys, are published in a more recent leaflet.

Bakery Training in Birmingham

By the spring of next year, the Birmingham Central Technical College plans to have completed reorganisation of, and extensions to, a bakery and catering department, where full-scale training in baking and catering will be given, with qualifying examinations designed and carried out by the City and Guilds of London Institute.

It is hoped that the scheme will provide skilled bakers and caterers for the industrial canteens in the Midlands whose efficiency has been handicapped by the shortage of experts. The College authorities also hope that the course will ultimately come to be considered as a training ground for hoteliers, in some measure taking the place of the former English custom of learning only by hotel experience.

Obituary

Mr. Harry Salmon, J.P., chairman of J. Lyons and Company, on October 18 at the age of 69.

His career with Lyons began soon after the building of the first teashop in Piccadilly in 1894. He left the City of London School at the age of 15, and went to work as a kitchen boy and waiter at the newly built Trocadero Restaurant. Later, he was transferred to Cadby Hall where the staff then numbered little over 100 and deliveries were by horse-drawn van. At 28 he was a managing director and in 1947 he celebrated fifty years' service with the firm.

In that half-century he was intimately associated with most of the company's major enterprises. These included the acquisition of tea plantations in Nyasaland, East Africa, the building of the three hotels, the Cumberland, Strand Palace, and Regent Palace, the four Corner Houses, the expansion of the chain of teashops throughout the country, and the company's development of its food manufacturing and wholesale business in Great Britain and abroad.

Mr. Salmon was the fifth chairman of the company since its foundation in 1887, and was the third brother to be chairman, his predecessors having been the late Sir Isidore Salmon, and the late Mr. Alfred Salmon.

In 1947 he was appointed the first chairman of the Catering Committee of the Tourist, Hotel Catering, and Holiday Services Board. He was a governor of the Polytechnic, Regent Street, a member of the Court of Governors of the London School of Economics, a member of the Governing Body of Dockland Settlements, Vice-President of the Jewish Home of Rest, and a Justice of the Peace for the Royal Borough of Kensington.

Food Workers' Wanderlust

A recent pilot census, taken in a typical factory district of Bermondsey by the Employment Committee, reveals that the food and metal industries have the largest proportion of wandering workers.

The food industry had in three months a turnover of 56 per cent. among men, and 96 per cent. among women. The report states that dissatisfaction with jobs seemed to bear no relation to hours of work, wages, physical working conditions, or relationship with fellow workers or supervisors.

A real factor was disinclination to transfer from job to job, or floor to floor within the factory, even though earnings might not be affected. There was a lack of appreciation of the need for such transfers.

The Port of Bristol

The facilities and services offered by the Port of Bristol for the quick turn-round of shipping and the efficient handling of imports and exports were illustrated in a film, produced in Bristol by F. G. Warne, and made at the City and Avonmouth Docks.

Grain, refrigerated produce, fruit, and timber are some of the principal commodities dealt with at the Avonmouth Docks, where large flour mills and cold storage plants line the quay sides. The chief operations at the City Docks are the handling of wood pulp and esparto grass, for the manufacture of paper, and the import of wines from France and Spain.

The modern mechanical equipment at the docks ensures speed in all operations. This is clearly illustrated by the fact that over 6,500 tons of grain have been discharged from one ship in a single day. The grain is discharged from the ship by means of floating elevators, and after passing through many mechanical processes it is eventually despatched by road, rail, and water. Some of the imported meat is despatched almost immediately, but the majority is held in the many cold stores until it is required.

Soft Drinks Technology Course

A soft drinks technology course, consisting of six weekly two-hour classes, has been started at Aston Technical College, Birmingham. Fifty students from the Midlands, including those already engaged in the industry, are attending the course, which covers all technical and chemical aspects of the production of soft drinks.

Mr. K. G. Curtis, secretary of Birmingham and District Mineral Water Manufacturers' and Bottlers' Association, who is largely responsible for originating the course, believes that these classes will help to improve the status of the mineral water trade, which he considers to be "the neglected Cinderella of the food trade" at present.

Cake and Biscuit Association

According to the thirteenth annual report of the Executive Committee of the British Cake and Biscuit Association for the year ended May 31, 1950, there are reasonable grounds for conjecture as to a further easing of controls.

The ultimate objects of the "Plan for the Biscuit Industry" were the restoration of full home trade competition within the industry and the relinquishment of the three controls, *viz.* the rationing of biscuits, the control of prices, and the allocation of raw materials.

The points system of rationing biscuits has been abolished; biscuit production is increasing, and the day can be visualised when it will reach a level which will render unnecessary the control of prices and the remaining terms of the Plan. This applies with equal or greater force to the cake and flour confectionery industry.

The probability is that controls both in volume and price of some of the raw materials used for the manufacture of cakes and biscuits will remain while shortage continues, but the Committee hold the view that considerable improvement could be effected if bulk buying by the Ministry of Food were eliminated and freedom in the procurement of their raw materials were given to the experienced buyers of the industry.

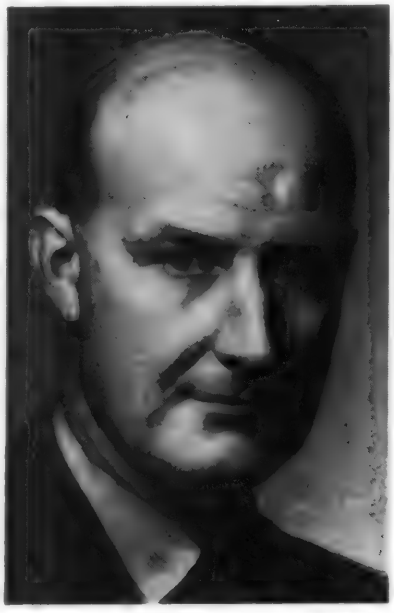
Change of Address

The Incorporated Sales Managers' Association have now moved to new offices at 4 Holborn Place, High Holborn, London, W.C.1.

Appointments

At the Fruit and Vegetable Canners' Association annual meeting, held recently in London, Lt.-Col. M. W. Batchelor, J.P., was elected chairman for the ensuing term of three years in succession to Mr. Christopher Cadbury.

It seems probable that his term of office will be a particularly difficult one. Tinplate supplies for canners were cut 10 per cent. this year and the future supply position appears insecure. There is also the question of the result of the public enquiry into the proposals made by English growers to introduce a Peas Marketing Scheme. Col. Batchelor has many times pointed out the difficulties which might arise in the canning industry, should such a method of control be adopted.



Mr. John F. Cunningham, A.M.I.E.E.

Mr. John F. Cunningham, A.M.I.E.E., has been appointed manager of the Leeds and District sales office of George Ellison, Ltd.

He joined the company in 1936, after serving an apprenticeship with Thomas W. Ward, Ltd., and was transferred to the London and District sales office in 1938, later representing the company as sales engineer in the South London Area. In 1946 he was recalled to the head office and appointed chief estimator.

Mr. Cunningham was commissioned as an electrical officer in the R.N.V.R. during the war, and was elected Associate Member of the Institution of Electrical Engineers in 1944.

Mr. Forrest T. Randell has been appointed manager of the Cardiff office of G. and J. Weir, and their representative in South Wales and the West of England, in succession to the late Mr. F. C. Williams.

Berlin Marketing Council

To facilitate and increase the volume of trade between West Berlin, Britain, and the British Dominions, an advisory council has recently been set up with offices in London, Berlin, Frankfurt, and Paris. Official British, American, and French support has been given and the Organisation has received the sponsorship of the Berlin City Authorities.

The importance of the Council lies primarily in its ability to improve the economic and political strength of Berlin and in its service to British and Dominion markets by informing them of sources of high quality supplies and of opportunities for export in this previously unexplored market.

Certain important additional activities are carried on by the Council. These include the facilitation of shipment and transportation of orders with a special regard to trade with the Dominions, the restoration of trade between Berlin's pre-war customers in the United Kingdom and Dominions, and general service in ensuring full co-operation between West Berlin, Britain, and the Dominions in matters concerning trade exhibitions.

All British trade enquiries are dealt with free of charge and are communicated direct to the Berlin branch who distribute the information to the appropriate firms in Berlin. Such enquiries should be addressed to the secretary, The Berlin Marketing Council (London), Slough Estates House, 16, Berkeley Street, London, W.1. (Telephone: Mayfair 7654.)

Data for Fish Exporters

Notes on the markets for imported fish in Australia, Austria, Colombia, Egypt, Greece, Malaya, Sweden, and Uruguay have recently been prepared by the Commercial Relations and Exports Department of the Board of Trade. The extent of the market in question, competition, distribution facilities, customs duties and special regulations, suitable packaging, and terms of payment are some of the various aspects covered.

New Food Premises

A new modern factory is being erected in Silvertown, London, E.16, for the Avondale Preserving Company, who hope to go into occupation in January next.

*

The Carlisle factory of Carr and Co. is being extended.

*

Plans for the erection of a new Bristol factory have been prepared by Morrison Confectionery Co., of Waters Road, Kingswood, Bristol.

*

Plans have been prepared by the Glasgow meat firm, J. W. Galloway, Ltd., for a bacon curing factory at Bellshill. The firm is seeking the use of the former slaughterhouse used by several of the County Council departments, and the Lanark County Council is to consider whether the premises may be made available for this purpose.

Schools' Maintenance Appeal

The following appeal has been issued by Lt.-Col. M. W. Batchelor, J.P., President of Appeal 1950, on behalf of the Royal Commercial Travellers' Schools:

Founded in 1845, the Schools have admitted over 4,800 boys and girls, orphans and needy children of commercial travellers.

Over 230 children (including 69 war orphans) are being maintained and educated at the present time.

There is no State grant for these Schools. They are supported entirely by voluntary contributions and have been from their very beginning. But costs have risen steeply in recent years, and now with vital building repairs requiring urgent attention, this is a specially onerous year.

The essential target is £50,000. A large sum, and a challenge to every trade. This is our year. A number of children from all trades are at the schools now. Others have been similarly maintained and educated in past years. Our debt is plain, so let us make a special effort this year. We *can* make 1950 a record.

Contributions for the list of the President of the 105th Annual Maintenance Appeal will be most gratefully acknowledged, and should be addressed to: Lt.-Col. M. W. Batchelor, J.P., Batchelors Peas, Limited, Wadsley Bridge, Sheffield, or The Royal Commercial Travellers' Schools, Kings Court, 48, Broadway, London, S.W.1.

Difficulties of Industry in 1951

THE CONTRIBUTION OF SALES MANAGEMENT

At the annual general meeting of the Incorporated Sales Managers' Association held in London recently Mr. W. E. Wheatley, sales director of H. J. Packer and Co., Ltd., and Charles Bond, Ltd., manufacturers of chocolate and other confectionery, was elected chairman for the ensuing year in succession to Mr. James Lenton.

Speaking of the conditions which are likely to confront industry in the coming year and of the contribution which sales managers can make to the easing of these conditions, Mr. Wheatley said they had been warned that fulfilment of the defence programme would entail some curtailment of the civil demand. They knew from experience during the war years and since that this would quickly be followed by scarcity conditions. The suggestion of possible methods of equating demand with restricted supplies was an essential job for the top-level planners and he thought the Association could be of assistance in tackling the task.

Another danger to the national economy was the general slackness that invariably resulted from any prolonged excess of demand over supply. When quality and value ceased to be the dominating factors in the sale of commodities, the effect very soon became demoralising to producers and consumers alike, and the impact on overseas trade could be nothing short of disastrous.

Referring to the question of distribution costs, Mr. Wheatley said it seemed to be the view in certain quarters that the cost of conveying any article of merchandise from the factory where it is made to the consumer was necessarily excessive. Such generalisations were palpably false, and he thought it could be demonstrated in most industries that selling charges were not unreasonably high when account was taken of all the attendant factors. He emphasised the importance and the urgency of the problem. The general price level was too high; it was restricting trade and impeding the free circulation of money in many directions, but the prime cause of the trouble was not selling costs. That was only one item in the price structure, but it was up to sales management to see that distribution charges, in the widest sense, were kept as low as possible, consistent with good service.

Industrial Perforated Plates

A new British Standard, B.S. 1669 (industrial perforated plates), which replaces that part of B.S. 481 (woven wire and perforated plate sieves and screens for industrial purposes), which was originally issued in 1933, has been issued by the British Standards Institution.

The Standard has been designed to cover industrial perforated plate having round and square apertures with the sizes and arrangements which are most commonly used, and tolerances on aperture size and pitch of apertures have been introduced.

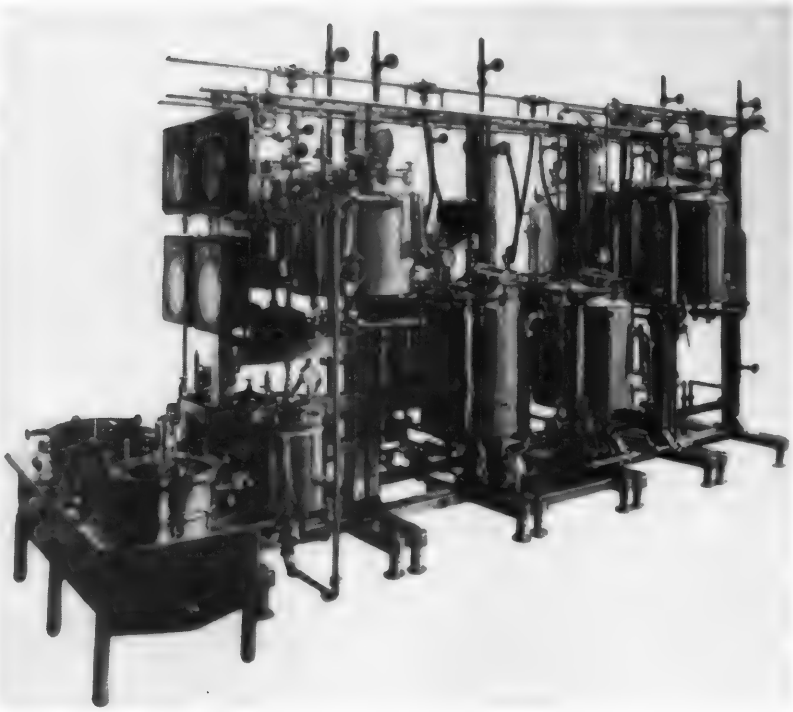
No attempt has been made to standardise other shapes of aperture such as slots, the main reason for this omission being that a very wide range of these different shapes of aperture is involved. The bulk of industrial requirements, is, however, covered by B.S. 1669.

The standard, in addition, contains three tables giving aperture sizes and three pitch arrangements for industrial perforated plate with aperture from $\frac{1}{8}$ in. to 3 in.

Electrostatic Precipitation

One of the most efficient means of removing particles, or dispersoids, from any laden gas stream or the atmosphere is the process of electrostatic precipitation, described in a recent booklet issued by Sturtevant Engineering Co. Efficiencies approaching 100 per cent. can be attained when required, and the plants operate on certain gases at temperatures as high as 900° F. They precipitate the dust in a dry, uncontaminated state, which is desirable on certain chemical processes, or if preferred, the dry dust can be mixed with water to form a paste, which will prevent its blowing about if discharged directly from the dust hoppers of the precipitator.

Among the systems developed by the company to meet the heating and ventilation needs of buildings of all classes are the combination of direct heating with air conditioning or with tempered air supply, unit heating, radiant panel heating, and others. Typical examples of those for industrial buildings are illustrated and described in another publication of the company.



Model brewing plant.

Model Plant for Brewery Research

Reconstruction of the building to house the model brewing plant designed for the Brewing Industry Research Foundation by A.P.V. is in progress and the final structure will include the following departments:

1. Store room for brewing materials.
2. Mash preparation room.
3. Brewing room.
4. Fermenting room.
5. Conditioning and cold storage room.
6. Bottle washing and filling room.
7. Bottled beer store.
8. Brewer's office, etc.

Throughout its construction, the model plant is intended to emulate, as far as possible, normal full scale brewing conditions. In addition it has been attempted to produce equipment easily adaptable to the various brewing processes.

To overcome some uncertainty as to the type of vessel most suitable for experiment, two prototype designs of fermenting plant will be installed for trial purposes. The performance of these will indicate the most favourable construction for additional vessels.

The conditioning plant consists of six 7 in. dia. stainless steel containers mounted in pairs on tubular frames. The vessels are of 5 gallons capacity and fitted with connexions for carbonating and sampling, etc.

For chilling and cold storage a refrigeration cabinet is provided. This accommodates four 5 gallon storage vessels, chilling from 65° to 32° F. in about 6 hours. The cooling medium is Arcton gas pumped through copper evaporator tubes surrounding each compartment.

Two Carlson pilot type filters will be supplied for two-stage filtration prior to bottling.

The bottling room will be equipped to carry out research into various methods of bottle washing, filling, and in-bottle pasteurisation. Bulk pasteurisation is being provided for, although extensive research in this field will not be undertaken at present. The main equipment will comprise:

1. An experimental bottle washing machine suitable for carrying out research into the various methods of washing employed in full size plant.
2. A single head counter pressure bottle filling machine capable of handling a maximum output of 50 dozens per hour, although the normal output will not exceed 10-12 dozens per hour. The machine is arranged to fill all types of bottles from mineral splits to quarts both aseptically and non-aseptically at high or low counter-pressure. For laboratory tests and for storage, the normal half pint size bottle will be used.
3. A single head crown corking machine with a sterilising device for the crowns.
4. A pasteuriser arranged to pasteurise in-bottle by the immersion, vapour, and spray methods.
5. Provision is being made for research into the filling of containers other than bottles, *i.e.* casks, cans, etc.

A separate room will be provided and fitted with adjustable racks for storing some 2,500 half-pint bottles.

Institution of Works Managers

The Council of the Institution of Works Managers has announced the election of new officers for 1950/51 as follows:

Vice-Presidents. Two additional Vice-Presidents have been appointed, namely, Sir Montague Burton, LL.D., J.P., chairman of Montague Burton and Sons, and A. G. Ramsey, C.B.E., chief engineer to the Ministry of Works.

Chairman. J. Connell, B.Sc., F.R.I.C., manager of the Izal factory of Newton Chambers and Co., becomes chairman in place of A. P. Young, O.B.E., M.I.E.E., who retires from this office which he has held for 16 years.

Deputy Chairman. C. N. Potter, works manager to Ilford, Ltd., has been elected deputy chairman *vice* J. Connell.

Honorary Treasurer. J. M. Weir, M.A., B.Sc., F.R.I.C., formerly division works manager, I.C.I. (Dyestuffs Division), becomes honorary treasurer in place of R. G. Berchem, M.Sc., managing director of Jeyes' Sanitary Compounds Co.

Need for Ice Cream Standard

The need to enforce a national standard for ice cream was stressed by Mr. George H. Searle, Wall's chief chemist, when he addressed 150 members of the Sanitary Inspectors' Association of Scotland after their recent tour of Wall's Edinburgh factory.

Introduction by the Government of a fixed minimum standard for the whole country would protect the integrity of the industry as a whole and safeguard the public, he said.

Dealing with hygiene, Mr. Searle questioned why, although so many sanitary inspectors paid a great deal of attention to the sampling of ice cream for bacteriological examination, nobody seemed in the least concerned about other food materials, excluding milk, which were consumed without heat treatment by the public.

BOOKLETS RECEIVED

A review of past difficulties and future prospects of the meat products industry is a feature of the autumn issue of *Wall's Magazine*.

The outlook is said to be more hopeful, and there is a move from a sellers' market to a buyers' market and details are given of the company's preparation for this return to a more competitive situation on the meat side of the business.

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Special design features of their range of homogenisers, covering all capacities from 10 to 1,250 gallons per hour, are described in a publication recently issued by G. and J. Weir. The meaning of homogenisation is fully explained, and reference is made to the treatment of various specific products.

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The subject of industrial drying and the application, main features, and advantages of Rotary Louvre principles are dealt with in a new brochure issued by Dunford and Elliott. Descriptions are given of the company's driers, coolers, and roasters, together with diagrams and photographs of actual installations, and a list of materials being processed by such installations.

▪

British, American, and Canadian patents describing special papers and plastics for packaging are among many new developments summarised in a recent issue of *Packaging Abstracts*.

New machines for washing, filling, stoppering, capsuling, and labelling bottles, for filling packs with eggs, seeds, ice cream, pills, carbon dioxide, cakes, etc., are described as well as one for labelling cylindrical articles, and an offset press for printing the outside of steel drums.

COMPANY NEWS

In weight, the 1949 beet crop was above average for the country as a whole, and was an all-time record in Scotland, Yorkshire, and North Lincolnshire, reported Sir Alan Saunders, O.B.E., chairman of the British Sugar Corporation, when he presided at the fourteenth annual ordinary general meeting.

The total yield was 3,962,000 tons of beet, but the average sugar content was the lowest on record, due primarily to the weather, although in many cases virus yellows disease was a contributory cause. Investigations into the control of this disease have been going on under the auspices of the Sugar Beet Research and Education Committee of the Ministry of Agriculture, and definite steps against it can now be taken.

The sum total of each individual factory's average daily output was a record at 38,911 tons per day; despite this high speed, a higher relative percentage of sugar was won than in the previous year.

Last campaign an experiment made two years previously in transporting raw sugar in bulk between factories was extended and sugar was successfully carried this way both between factories and to the refiners. Arrangements had been made to deliver still larger quantities in bulk during the next campaign.

▪

During the past eight years the costs of ingredients for biscuit baking had advanced by 176 per cent., while the price to the consumer had risen by 40 per cent., said Mr. James Lang, chairman, at the quarterly meeting of the United Co-operative Baking Society which was held in Glasgow recently.

It was also reported that sales for the previous thirteen weeks showed an increase of 25·7 per cent. in money value over the corresponding period a year ago.

Judging from the increased business, said Mr. Lang, the process of development being undertaken by the federation appeared to be more than justified.

The loaf bread bakery at McNeil Street, Glasgow, was responsible for the greater portion of this increase, the actual increase in the volume of bread produced being 35·2 per cent. over the same period a year ago.

The demand for wrapped bread had exceeded all expectations; of the total batch bread production, almost 80 per cent. was wrapped.

The small bread and pastry factory at McNeil Street recorded increased sales of 10 per cent. To cope with the demand for French cakes and decorated cakes, an extension to the building would be completed within the next few weeks.

The biscuit factory at Clydebank increased its sales for the quarter by 22 per cent. To produce additional cream sandwich biscuits a new type of creaming machine, capable of producing three tons of biscuits per day, had been installed.

OBITER DICTA

● Fish which formed part of the harvest festival decorations of St. Mary's Church, Appledore, over the weekend, were previously soaked in Eau-de-Cologne.—*" Western Morning News."*

● In recording the death of Mr. E. in our last issue, we stated that he had worked on a farm most of his life. This should have read that he had been a farmer most of his life. —*" Boston Guardian."*

● The small uptake of the welfare foods is not confined to Aberdeen, but applies to the whole of Scotland. The reasons? There is the old-fashioned one of the Scot not liking to accept charity.—*Aberdeen food official.*

● Meat may be defined as stuff from the Argentine from ewes that won't die, stuff that Smithfield porters will not carry, and stuff that the cat will not eat.—*L. D. Gammans, M.P., speaking at the Procea annual dinner.*

● Mothers have a horror lest their children should feel the slightest pangs of hunger. At one school, mothers congregate round the playground during break and feed their offspring through the railings like animals at the zoo.—*Dr. Ffrangcon Roberts in " The Lancet."*

● Can it be that Mr. Morrison looks on himself as a prospective father-in-law for Mr. Cube? If that be the case, let me hasten to assure him that Mr. Cube is already happily married to free enterprise, and has no intention of seeking a divorce.—*Lord Lyle of Westbourne, President of Tate and Lyle.*

● Although I prefer good wholemeal bread and whole cereals to any kind of devitalised cereal food, I am convinced that cereals are far from ideal foods for human beings. For birds with gizzards and certain animals cereals are quite suitable, I should say.—*Correspondent to " Whole Food."*

● Surely, as guardians of the people's health, the medical profession should be concerned with this widespread use of virulent poisons in food production with what appears to be quite inadequate safeguards for those who eat the food products as for those who use the sprays.—*Correspondent to the " British Medical Journal."*

World Food News

Anti-locust Campaign

Fifty-seven specially equipped American trucks supplied by the Marshall Plan are being sent to the Middle East and Africa to take part in an emergency British-led anti-locust campaign to save millions of dollars' worth of vitally needed foodstuffs.

The Desert Locust Advisory Committee at Nairobi, composed of representatives from British Colonial Governments and countries in the Near East and Africa, has reported that a large-scale movement of desert locusts in these areas is imminent. Heavy breeding of the insects due to unparalleled rains is the chief cause of the threatened plague, and control measures which commenced in early November will be built up to full scale and cover all breeding areas at the beginning of next year.

The British Government and British Colonial Territories have allocated the equivalent of $10 million over a three-year period to provide for staff, equipment, and insecticide to check the plague and avert a recurrence of the disasters suffered in 1927-34.

The American trucks will be equipped with sand tyres and winches. They form a part of a large mobile force which eventually will number up to 1,000 vehicles, the bulk of which will be operated under desert conditions in the Arabian Peninsula. The vehicles will carry the equipment and teams of skilled and unskilled workers as well as bait and insecticide for the destruction of the locusts. Marshall Aid funds allotted for the purchase of the trucks, for spare parts, and for shipping charges from the United States to Jedda and other ports, total $179,000.

More Turkish Sugar Refineries

The Government of Turkey is reported to be negotiating with private investors regarding the establishment of two sugar refineries at Adapazari and Adana, in order to increase the present insufficient output of about 100,000 tons.

Whale Oil Vitamin Research

Norwegian scientists are to continue research on the APF vitamin (animal protein factor) obtained from whale waste products during the coming whaling season, and they will accompany two of the floating whale oil refineries to the Antarctic for this purpose. If the experiments are successful, Norway hopes to be able to produce valuable quantities of the new vitamin; the Norwegian whaling expert and shipowner, Lars Christensen, is building a research station at Sandefjord to investigate its production.

Discovered and isolated some 20 months ago, this highly concentrated vitamin, which is also found in herring and other fish, has been established by American scientists as the most important factor for animal feedingstuffs.

New Cheese Branding Process

A new process for the branding of cheese for control or advertisement purposes has been introduced by Reclagrafia, of Warmond, Holland. Experiments have been made on a Dutch Gouda cheese, but the process may be used for other rind cheeses, such as the Cheddar type, which are made in a bandage.

The cloth is printed with a special non-poisonous ink; the design does not smudge during pressing, but while the cheese is ripening, a sharp, clear print is obtained on the surface.

Since the design appears from under the cloth, genuineness is guaranteed, and, owing to the composition of the cloth, the print has a character of its own which cannot be imitated by a stamp or other means.

The process costs little, and does not entail extra work.

Fish Canning in El Salvador

In order to encourage the development of fishery resources and the establishment of canning factories in El Salvador, concessions, including exemption from taxes on the use of public waters and the import of equipment free of duty, have been granted to fishing enterprises and canneries (including canners of vegetable and meat products) for a period of 15 years, subject to the fulfilment of certain standard requirements.

S. African Canned Meat Imports

The import control regulations in South Africa now permit the importation of canned meat containing not more than 5 per cent. cereal.

For some time now the importation of this line has been prohibited, together with canned meats generally. The meat supply position in South Africa has deteriorated rapidly in the past few months, however, and this has doubtless caused the authorities to make this new decision.

Whereas in the pre-war period South America was the main supplier of canned meat to the Union, in recent years Australia has provided most of the supplies and a limited quantity has come from the United Kingdom.

Australian Sugar Congress

One hundred scientists, representing thirteen nations, were present at the seventh conference of the International Sugar Cane Technologists held in Queensland recently after an interval of twelve years.

During their three weeks' stay, the delegates toured the sugar areas in a special train provided by the Queensland Government; they visited twenty-one sugar mills, many cane fields, and every important sugar experimental station in a journey of 3,000 miles.

The last week was spent in discussion at a conference in Brisbane, devoted mainly to the question of how to increase sugar production without extending the size of plantations. According to the President, Dr. Pieter Honig of the United States, the world was too short of food now to spare any more land for sugar, and the present shortage must be overcome by growing more sugar on the same land.

OVERSEAS ENQUIRIES

Macaroni Machinery

The Commercial Department of the British Embassy at Oslo has advised that the Freia Chocolade Fabrik A/S, Verksgaten, 28, Oslo, desires to start production of macaroni and would like to contact United Kingdom manufacturers of the required machinery.

It is suggested that United Kingdom manufacturers should communicate with the company direct, giving an indication of the plant they have to offer.

▪

Crumpets in Airtight Containers

The British Consulate-General at Chicago has reported that Rueben Dight, Inc., of 654, West Diversey Parkway, Chicago, 14, are interested in obtaining agencies of United Kingdom firms for crumpets (pikelets) packed in airtight containers.

Firms interested in this enquiry should communicate with the company direct, quoting prices c.i.f. in U.S. currency.

▪

Shelled Walnuts

The British Consulate-General at New Orleans has reported that Sewell Thompson and Caire of 852, Carondelet Street, New Orleans, 13, Louisiana, are interested in receiving quotations for the supply of shelled walnuts.

Firms interested in this enquiry should forward quotations direct to Mr. Kenneth Thompson at the address stated, giving an indication of delivery dates. Quotations should include the net f.o.b. price, freight, consular fees, and complete insurance coverage as components of the c.i.f. New Orleans price in dollars.

▪

Rice Hullers and Polishers

The British Consulate-General at Port-au-Prince has advised that Charles Fequiere and Company, Rue Roux, Port-au-Prince, desire to contact United Kingdom manufacturers of rice hulling and polishing machines with a capacity of 500 to 600 lb. per hour. The machinery is to be belt driven and to be used with Diesel engines of 10 to 15 h.p.

It is suggested that United Kingdom manufacturers who can supply the required machinery should forward full details of the equipment they have to offer, including prices, delivery dates, and any available literature, to the Haiti company.

Bakery and Biscuit Machinery

The United Kingdom Trade Commissioner at Montreal has reported that the Victory Tool and Machine Co., Ltd., 236-250, Rose de Lima Street, Montreal, has expressed an interest in representing United Kingdom manufacturers of bakery and biscuit making machinery and, in particular, ovens, water-cooled mixers, marshmallow depositors, and cream making machines on a commission basis in the first instance.

United Kingdom manufacturers of the above-mentioned machinery who desire representation in the Canadian market are invited to communicate direct with the Montreal company giving full details of the products they have to offer.

▪

Bacon Factory Equipment

The Counsellor (Commercial) to the British Embassy at Brussels has advised that the firm of Africongo, Leopoldville, is at present studying the possibility of installing a bacon factory in the Belgian Congo and would like to establish contact with United Kingdom manufacturers of the required equipment.

It is suggested that United Kingdom manufacturers who can supply the required equipment should send full details of their products, including, if possible, prices for a standard installation and any available literature, direct to Africongo, S.C.P.R.L., Boîte Postale 345, Leopoldville, Congo Belge.

▪

Packaged Foodstuffs

The British Consulate at Denver, Colorado, have reported that Ross Grenard Co., 26, Wazee Market, Denver, have expressed an interest in studying the possibilities of introducing lines falling into one or more of the categories set out below, if these can be supplied direct by United Kingdom manufacturers at competitive prices:

Bakers' sundries, cake decorations, etc.; biscuits; cocoa powder; confectionery; custard powders and similar products; honey; jams; marmalades; pickles; and preserved fish.

The Denver firm wish to examine the possibilities of importing on their own account or to arrive at arrangements with United Kingdom firms for importation on a consignment basis.

United Kingdom firms who are interested in this enquiry should communicate direct with the company, Ross Grenard Co., quoting prices, in U.S. dollars, both f.o.b. a British port and c.i.f. Houston, Texas, New Orleans, and/or other American eastern seaboard ports.

▪

Agency for Food Specialities

The United Kingdom Trade Commissioner at Winnipeg has been informed that Scott-Bathgate, Ltd., 149-151, Notre Dame Avenue East, Winnipeg, wish to obtain exclusive selling rights of United Kingdom manufactured biscuits, confectionery, and all types of food specialities.

They wish to act as importing distributors and are prepared to package goods such as confectionery in their own Winnipeg plant.

United Kingdom manufacturers who are interested in this enquiry should submit direct to the company full details of their products and available literature with f.o.b. United Kingdom prices in sterling. It would be of advantage for confectionery firms to quote in bulk quantities, but quotations in containers such as 7 lb. tins or 7 lb. glass jars are not generally acceptable.

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Confectionery or Grocery Products

The United Kingdom Trade Commissioner at Montreal has reported that Sunlite Food Products, Inc., 9760, St. Lawrence Boulevard, Montreal, have expressed an interest in representing a United Kingdom manufacturer of confectionery or grocery products.

Firms interested in this enquiry should forward quotations c.i.f. Canada direct to the company.

H.M. Consul at Guayaquil has reported that The Salon Fortich, S.A., P.O. Box 184, Guayaquil, has expressed a desire to obtain an exclusive agency for the distribution of United Kingdom manufactured confectionery.

United Kingdom manufacturers who are interested in this enquiry should furnish quotations direct.

▪

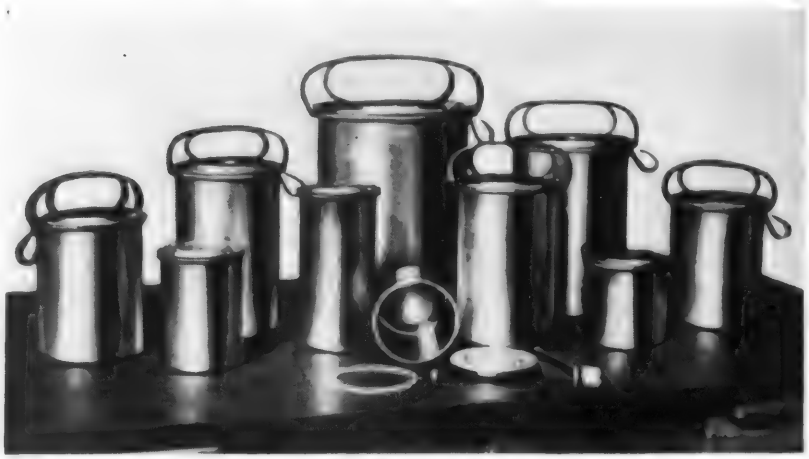
Tube Filling and Closing Machines

An enquiry has been received from the Bengal Chemical and Pharmaceutical Works, Ltd., 94, Chittaranjan Ave., Calcutta, 12, for an automatic tube filling and closing plant.

It is suggested that any United Kingdom firms interested in the enquiry should send full details of any machines they are able to offer to the Indian firm.

Aluminium Container for Food

NOVEL SEALING DEVICE



A recent development of unusual interest is the invention, by Dr. Weisse, of a new type of container which is being manufactured by Aluminiumwerke Göttingen G.m.b.H., Germany. The aluminium container, produced in several sizes, is composed of five essential parts—a container, a lid, a rubber ring, a rubber stop, and a clamp—and can be used for all forms of canning.

Made of aluminium, and lined with a protective lacquer which enables it to withstand chemical attack by foods, the Weisse container is rustproof, unbreakable, and light. Since the weight of the aluminium container is only about one-seventh the weight of a comparable jar of glass or earthenware, its ease of handling is particularly apparent. The Weisse can does not break when dropped, and the metal can be marked readily with a soft pencil.

The outstanding feature of the can is in the sealing arrangements contained in the lid. This lid is made with an indentation for a thick rubber ring which provides an air-tight seal, and has provision for a rubber stopper which is forced by hand into the top before the container is sealed. During the normal process of canning food, a vacuum is created when the container cools, which holds the stopper and lid in place; but a clamp is required for holding the lid in place during cooking. Removal of the rubber stopper eliminates all difficulty in removing the lid.

A variety of sizes ranging up to 10 litres (approx 17·62 pints) are now being manufactured. Production of over one million of these containers is planned in Germany for the coming year, and steps are being taken to find firms in other countries to manufacture them under a licensing arrangement (*Aluminium News*).

Adhesive for Wrapping Materials

A new adhesive for fabricating multiwall and specialty bags from polyethylene-coated kraft stocks, resulting in successful packaging for a wide range of products, machines cleanly on direct roller application, tacks immediately even at the rate of 100 10 pound bags per minute, and dries to a transparent, light grey film unaffected by variations of temperatures or humidity.

Manufactured by National Adhesives, Poly-Lok adhesive produces seams which withstand hot calcium oxide at 250° F. and food locker temperatures down to –20° F.; it protects flavours and keeps hygroscopic products from coalescing.

Persian Contracts

The following information supplied by the Commercial Secretariat at the British Embassy in Tehran may prove helpful to United Kingdom manufacturers tendering for Persian contracts.

United Kingdom firms may be aware that the Persian Seven Year Plan Organisation requires that a bank guarantee must accompany all tenders called for by the Seven Year Plan Organisation. The Organisation has, however, pointed out that many tenders are received from United Kingdom firms without a guarantee and that since tenderers from other countries usually provide guarantees, these United Kingdom offers stand in danger of being rejected.

The purpose of the guarantee is to ensure that all offers made against calls for tenders shall be of a serious character and that the person making the offer shall be in a position to fulfil it should he win the tender.

The bank guarantee varies in percentage, *i.e.* for important and large tenders 3 per cent. is called for, for smaller tenders 5 per cent., and occasionally even 10 per cent. guarantee is required. The percentage required is mentioned in the conditions attached to the call for tenders.

The term of the guarantee is 30 days. Guarantees lodged against unsuccessful tenders are immediately released when the contract is awarded to the winner.

When the contract has been awarded, the winner's tender guarantee is released, but he is required to furnish a further guarantee (usually of 10 per cent.) to be held until he has fulfilled his obligation under the contract. Similar guarantees are usually required in connexion with calls for tenders made by other Persian Government departments.

The Purchasing Department of the Seven Year Plan Organisation has recently announced that it will accept bank guarantees only if they are submitted through the Bank Melli Iran (The National Bank of Iran) or the British Bank of Iran and the Middle East.

British firms making offers to Persian Government Departments and to the Seven Year Plan Organisation should, therefore, arrange to submit their guarantees through either of these banks. The Head Office of the British Bank of Iran and the Middle East is at 51, Gracechurch Street, London, E.C.3; the Bank Melli Iran has an office at 123, Old Broad Street, London, E.C.2.

Meat Canning in Guatemala

For the first time, meat is being canned in Guatemala. The company concerned is the recently established *Compania Centroamericana de Conservas, Sociedad de Responsabilidad Limitada*, founded with Guatemalan capital and directed by a French specialist. The new factory also packs fruit and vegetables by modern methods.

An American company employing local labour has been preserving foods, other than meats, in cans and glass jars for several years.

Licensing of Irish Exports

The Minister for Agriculture in the Republic of Ireland has forbidden, with effect as from November 1, 1950, the export of any paste, jelly, or other edible preparation containing fish or any part thereof except under licence. The Order does not apply to exports not intended for human consumption.

Sugar Factories for Germany

A large new sugar factory to supply the South German market is to be erected at Ochsenhausen/Mainfranken. The setting up of a plant in this important sugar growing region will reduce transport costs substantially. Construction of the factory was originally proposed by the Bavarian and Wurttemberg-Baden Government to the Federal Ministry of Food, which has undertaken to support the plan, and some ERP counterpart funds may be released for the project.

Two further sugar factories, one of them in the North German Province of Slesvig-Holstein, are to be set up under similar conditions. It is hoped that this will lead to an expansion of domestic sugar production and a consequent reduction in sugar imports.

Swedish Plastics Exhibition

The Swedish Plastics Federation, in co-operation with the St. Erik's Fair Company, propose to organise a Plastics Exhibition in Stockholm from May 11 to 21, with a possible prolongation until May 27, 1951. United Kingdom manufacturers having agents who are members of the Swedish Plastics Federation are eligible to participate.

Closely connected with the commercial section will be an instructional section, arranged by the Federation, to demonstrate the development of the plastics industry. Manufacturers are invited to submit free of charge typical finished products, semi-manufactured products, and materials for exhibition in this section in return for a special mention in the catalogue.

Manufacturers interested in participation are advised to make immediate application, through their agents, to Mr. Malmsten, St. Erik's Fair Co., Ltd., Lidingovagan, 10, Stockholm, 26.

Information about the current Swedish import licensing position on goods which would be shown may be obtained from Tariff Section, Commercial Relations and Exports Department (I.B.), Thames House North, Millbank, London, S.W.1.

Frozen Irish Meat for U.S.A.

Some 120 tons of frozen meat, the first shipment of its kind ever to be sent from Ireland, recently left Dublin for New York. The meat, part of which is being frozen by the Dublin Pure Ice and Cold Storage Company, will be used for table purposes. It is being exported by the Fresh Meat Exporters' Association, and this shipment is expected to be followed by many substantial consignments.

Fifty tons, sent by way of sample, were shipped by Clover Meats of Waterford.

Edible Surface Active Agents

A bulletin containing descriptions of edible surface active agents, including emulsifying, stabilising, defoaming, thickening, suspending, and softening agents for the food and allied industries, has been issued by Glyco Products Co., New York.

These products are made with natural fats and oils under rigid control to definite specifications, and are used to advantage in baked goods, candy, chewing gum, ice cream, oleomargarine, peanut butter, yeast, and other foods.

The bulletin also contains data on these materials and suggestions for their use.

News from the Ministries

Imported Apples

On September 28 last the Minister of Food announced his intention to remove the controls over the price and distribution of imported apples as soon as the necessary arrangements could be made. To give effect to this decision, the Minister has now revoked as from November 5, 1950, the Imported Apples Order, 1948, as amended.

Bread Subsidy for N. Ireland

Following consultation with the trade, the rate of bread subsidy in Northern Ireland is being increased from 3s. 6d. to 3s. 11d. per sack with effect from April 23, 1950; to 4s. 3d. per sack with effect from June 18, 1950; and to 9s. 10½d. per sack with effect from August 27, 1950.

As in England, Wales, and Scotland, the rate of subsidy operating from August 27 includes an allowance for trends of 50 per cent. of the calculated increase of subsidy.

Coarse Grains from U.S.S.R.

Following discussions in Moscow between representatives of the Ministry of Food and Exportkhleb, a contract has been signed for the supply to the United Kingdom of 300,000 tons of maize, 425,000 tons of barley, and 75,000 tons of oats.

The quantities supplied under last year's contract were 400,000 tons of maize, 500,000 tons of barley, and 100,000 tons of oats.

Sugar for Bees

In the November issue of FOOD MANUFACTURE it was announced that a supplementary allowance of 5 lb. of sugar per colony would be made available to beekeepers, and that those beekeepers who chose to take their spring allowance with their winter one must wait until February 1, 1951, before drawing the supplementary allowance.

Following representations from beekeepers, the Ministry has now decided that all beekeepers (irrespective of whether or not they have taken both their winter and spring allowances) may draw the supplementary allowance at any time up to June 30, 1951.

Applications for permits should be made on the official application form obtainable at local food offices. The completed form should be countersigned by a responsible person and returned by the applicant to the food office.

Raw Cocoa

Following the decision to end the buying of raw cocoa on Government account, the Minister of Food has revoked the Raw Cocoa (Control and Maximum Prices) Order, 1946, as amended, so as to free raw cocoa from price and other controls. The revocation took effect on November 1, 1950.

The rationing of chocolate confectionery and the existing controls over the prices of chocolate confectionery and other cocoa products continue.

Changes in Freed Goods List

As from November 1, further items have been added to the list of goods which may be imported without individual licence from the usual list of countries.

These goods include raw cocoa, dates, and onions in syrup. The categories of plastic goods have been completely revised.

Liberalisation of Trade

As from November 1, Britain's "liberalisation" import concessions have been extended to Switzerland and Liechtenstein. The concessions permit the import without individual licence of a wide range of goods from O.E.E.C. and many other soft currency countries.

This concession follows Switzerland's decision to accede to the European Payments Union.

With the extension of these concessions to the last of the O.E.E.C. countries, the various categories of privately imported goods now freely importable from O.E.E.C. countries represent approximately 86 per cent. by value of all 1948 imports from O.E.E.C. countries of goods now privately imported. (1948 is the year against which all O.E.E.C. "liberalisation" results are measured.)

This is considerably above Britain's formal obligations under O.E.E.C., which require the liberalisation of 60 per cent. of imports on private account.

Chocolate Biscuits

When the cost of chocolate couverture fell early in 1949, the benefit was passed on to the public by reducing the maximum retail prices of chocolate biscuits by 1d. a lb. The cost of chocolate couverture has risen again and it has been necessary to restore the old maximum prices of all types of chocolate biscuits by increasing the present prices by 1d. a pound, with effect from October 22.

This increase will be effected by re-classifying the different varieties of chocolate biscuit within the "Product Groups" shown in the Second Schedule of the Biscuits (Maximum Retail Prices) Order, 1948, as amended.

Stocks already in the hands of retailers and wholesalers will not be affected and the increase will apply to those goods (including imported chocolate biscuits) labelled with the revised Product Groups number and maximum retail price.

Prices of Shell Eggs

The Eggs (Great Britain) Order, 1950, and the Eggs (Northern Ireland) Order, 1950, which consolidate with amendments the Eggs (Great Britain) Order, 1949, and the Eggs (Northern Ireland) Order, 1949, have been made. The new Orders, which came into force on October 15, 1950, revoke the Eggs (Great Britain and Northern Ireland) (General Licence) Order, 1950, and prescribe new maximum wholesale and retail prices for eggs.

The Eggs (Great Britain) Order specifically prohibits the use of eggs for manufacturing purposes, other than by a catering establishment, except under licence.

More Meat in Sausages

In accordance with his announcement in the House of Commons on October 25, the Minister of Food has made an Order which raises the minimum meat content of pork sausages and pork sausage meat (including pork slicing meat) from 50 per cent. to 65 per cent., and increases the maximum wholesale and retail prices of pork sausages, pork sausage meat, and beef sausages as follows:

	On a Sale by Wholesale			
	Old Price		*New Price*	
	s.	*d.*	*s.*	*d.*
Uncooked pork sausages	1	4	1	8½
Uncooked pork sausage meat (including pork slicing sausage) ...	1	2	1	5
Uncooked beef sausages	1	1½	1	2½

The price of uncooked beef sausage meat remains unchanged.

The new Order, which further amends the Meat Products and Canned Meat (Control and Maximum Retail Prices) Order, 1948, came into force on November 5, 1950.

Commonwealth Sugar Agreement

The Government of New Zealand have informed the Government of the United Kingdom of their desire to participate until 1957 in the Commonwealth Sugar Agreement; the U.K. Government have informed the governments of other participating Commonwealth countries accordingly.

Under arrangements proposed by the New Zealand Government, the Ministry of Food will continue to supply until the end of 1952 all New Zealand requirements of raw sugar at prices to be negotiated each year within the Commonwealth Agreement. Thereafter from 1953 to 1957 inclusive, New Zealand has agreed to buy 75,000 tons a year of Commonwealth sugar at Commonwealth guaranteed prices. New Zealand will buy the remainder of her requirements during this period in the world market.

The U.K. Government have accordingly informed participating countries that, if producers so wish, the United Kingdom will be prepared to increase by 75,000 tons, *i.e.* from 1,568,000 tons to 1,648,000 tons, the amount of sugar the United Kingdom has undertaken to buy each year at guaranteed prices from 1953 to 1957. These arrangements will not affect the aggregate target figure of exports from Commonwealth sugar-exporting countries which remains at 2,375,000 tons.

Marzipan from W. Germany

Arrangements have been made for a limited quantity of marzipan to be imported from Western Germany under individual licence.

The marzipan will be imported through normal trade channels. Applications for import licences should be made in duplicate on the usual form ILD/A, obtainable from the Board of Trade, Import Licensing Branch, Romney House, Tufton Street, S.W.1., and from the usual Customs Offices. For administrative convenience, completed application forms should, in the first instance, be submitted to the Bakery Division of the Ministry of Food, London Road, Stanmore, Middlesex.

The marzipan to be imported under these arrangements should consist of ground almond kernels and sugar only and the almond kernel content must be at least 20 per cent. The unqualified description "marzipan" may be applied only where the percentage of almond is not less than 66⅔ per cent. In all other cases the word "marzipan" should be qualified by the addition of the actual percentage of almond kernels in the mixture, *e.g.* marzipan (40 per cent. almonds). Applications for import licences should be endorsed with the following information:

(*a*) Prices f.o.b. and c.i.f.

(*b*) Composition of the marzipan, *i.e.* percentage of sugar and almond kernels.

(*c*) Type, size, and weight of pack.

Information and Advice

Botanic Beer

B.4707. *Could you provide me with a good recipe for a botanic or herbal beer, and also say how a dry extract for the same could be prepared?* (Australia.)

It should be noted that it is no longer correct to use the term "beer" with reference to any soft drink or non-exciseable product other than "Ginger Beer." A good formula for a botanic beverage of the class formerly often described as "herb beer" is as under:

Water to form 40 gallons concentrate to be used at the rate of 4 oz. per half-pint bottle.	
Caramel	1 lb.
Sugar	25 lb.
Saccharin "550"	1½ to 2 oz.
Hops (new season's) ...	1¼ lb.
Horehound	1¼ lb.
Dandelion root	2½ lb.
Ginger root, crushed ...	8 lb.
Gentian root	1½ lb.
Brewers' yeast	1 to 1½ pints
Isinglass finings	1 to 2 quarts
Grape tannin	1 to 2 oz.
Block juice	14 oz.

If a copper with false bottom is available, all herbs with the exception of the hops should be boiled for half an hour, then the hops are added and boiling is continued for another quarter of an hour. If the copper has no false bottom, two bags of strong but fairly open mesh fabric may be used, placing the hops in the first and the other herbs in the second. The herbs are then boiled for 25 minutes, the hops are added and boiling is continued for another 25 minutes. The bags should be squeezed slightly as they are raised above liquor level. In either case, the sugar, caramel, and block juice may be added and dissolved with the heat turned down, in the copper, or with a portion of the hot wort run into the fermentation vessel; the remainder of the wort is cooled down as it is passed to the vessel, the length being adjusted to that required (40 gallons plus allowance for draw-off) and the temperature to about 70° F. in summer, or a few degrees higher in winter. The wort is then pitched with yeast and fermentation continued for 12 hours, after which the yeast head is skimmed off. The process is continued for from 24 to 36 hours according to conditions and the class of yeast.

After a final skimming, the wort is racked off to the settlement or fining tank and, with the temperature as near 65° F. as possible, the tannin, made into a solution with hot liquor, is added and well mixed, after which the finings are thoroughly roused in. The wort should clarify with a fine crust within 18 to 24 hours, and may then be bottled off, 4 fl. oz. being "syruped" to each bottle. The bottles are filled up with carbonated water to have a final gas content of approximately 2·50 to 2·75 volumes.

The same formula may be used for self-conditioned botanic beverage, the above quantities of ingredients making 100 gallons of wort. Fining in this instance is inadvisable, as bottle condition is usually retarded. The procedure, after final skimming, is to rack off very carefully, preferably giving a settlement time in one fining tank, then racking a second time to another tank, and bottling on a syphon filler. The product is stored at about 60° F., coming into good condition within 10 days to 8 weeks.

With regard to dry extracts, these may be made by milling and pulverising the various herbs, etc., with or without various fillers and binding agents; alternatively, highly concentrated liquid extracts may be made, then dried to powder or paste form, *e.g.* by vacuum spray treatment, or again some form of more or less inert powdered material may be impregnated with liquid extracts of the various herbal ingredients. This style of preparation, however, is usually outside the scope of the botanic beverage brewer, and is best left to the essence supplier.

Golden Crunch Biscuits

In the November issue of FOOD MANUFACTURE, page 483, a recipe was given for "Golden Crunch Biscuits." We have been informed by Messrs. Golden Crunch, Limited, of Prestbury Road, Cheltenham, that they have been carrying on the manufacture of "Golden Crunch" biscuits for many years, and we wish to place on record that the recipe given does not in any way refer to biscuits made by this Company, but refers to those known as Krunch or Flapjack.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.4678. *Hydrogen compressor.* (Calcutta.)
B.4679. *Rope prevention and lubrication of baking machinery.* (Israel.)
B.4680. *Drying plant.* (Pakistan.)
B.4682. *Sterilisation temperatures.* (London.)
B.4683. *Manufacture of bone by-products.* (Yorks.)
B.4685. *Chutney and Worcester sauce.* (London.)
B.4687. *Pea canning.* (Suffolk.)
B.4688. *Sweetened condensed milk.* (Hunts.)
B.4689. *Training in food technology.* (Nigeria.)
B.4690. *Impermeable film.* (France.)
B.4691. *Table jellies.* (London.)
B.4693. *Canning plant for apples.* (Ireland.)
B.4694. *Biscuit packing machinery.* (Sussex.)
B.4695. *Cans.* (Ireland.)
B.4697. *Stoving lacquers for aluminium.* (London.)
B.4698. *Preserves handling.* (Lanark.)
B.4699. *Boilers.* (Lancs.)
B.4700. *Wrapping and sealing machines, and waxed card presses.* (Ireland.)
B.4702. *Agar-agar.* (Beds.)
B.4703. *Salted nuts.* (Yorks.)
B.4704. *Dog biscuit plant.* (Lancs.)
B.4706. *Nut cracking machinery.* (Lancs.)
B.4708. *Liquorice making machinery.* (London.)
B.4709. *Use of spray dried yolk.* (London.)
B.4713. *Swansdown bags for filtering jelly.* (Kenya.)

Recent Patents

644,312. HAMMER, A. V.: Heat-exchange device for treating oil, cream, fat emulsions, and other viscous substances.
644,349. EDMONDS, LTD., G., and COLLINS, W. H.: Mincing or chopping appliances.
644,398. ROSE BROS. (GAINSBOROUGH), LTD., ROSE, A. G., and GILBERT, J. A.: Packages and the formation thereof.
644,423. BEEBE, S. J.: Sugar dispenser.
644,483. AKTIESELSKABET NIRO ATOMIZER, and NYROP, J. E.: Preparation of extracts of coffee and/or coffee substitutes.
644,488. JACKSON, M. I.: Chambers for cooling and cold storage.
644,494. WINGFOOT CORPORATION: Packaging apparatus.
644,507. SMITH, C. A., and ETTE, E. A.: Honey frames for use in beehives.
644,536. MIKROVAERK AKTIESELSKABET: Casting chamber for the casting of products such as chocolate.
644,612. JACKSON BROS. (OF KNOTTINGLEY), LTD., and YORK, J.: Closures for jars and like containers.
644,624. SCHULTHEISS, H.: Means or apparatus for maintaining bags or sacks open while being filled.
644,725. PEARLITE BOX CO., LTD., and JAMES, D.: Boxes or like containers for sweetmeats and other commodities.
644,799. WESTERN CONDENSING CO.: Process for manufacture of milk sugar.
644,802. TADEMA, S.: Ice cream freezers.
644,988. DUNMIRE, R. P.: Decomposable substances such as vitamins and other food supplements.
645,045. GIBSON, L.: Bean cutter.
645,054. GRUBBEN, E.: Process and apparatus for the partial or complete rendering to powder of cereal grains.
645,131. TORRES, A. S.: Roasting of edible beans and nuts.
645,192. AMERICAN CYANAMID CO.: Purification of aqueous solutions of sugar.
645,270. SMITH, C. A.: Beehives.
645,293. GLASS WHOLESALE SUPPLIES, LTD., and MYERS, C. C. T.: Closures for bottles or containers.
645,347. UDEMA, W. J.: Filled pastry rolls.
645,411. STUE, T. B.: Cartons, boxes, and like containers.

Abstract of a Recent Specification

Roller Mills for Cereal Products

This invention relates to roller mills for cereal products and is concerned with the lubrication of the journal bearings of the rolls.

In roller mills of the type in which four rolls are provided in each frame, the journal bearings of the rolls are normally rather inaccessible for oiling and are frequently completely covered in by panels to provide an exterior of the machine which is easily cleaned. To provide ease of lubrication, it has been proposed to place an oil reservoir at the top of each side frame with pipes leading to each of the bearings in the frame so that all the bearings can be filled with oil from this reservoir. This arrangement has two disadvantages: before the rolls can be changed, it is necessary to break all the pipe connexions to the bearings and when a charge of oil is poured into the reservoir, it is not possible to tell whether each bearing has received its appropriate share.

The object of the invention is to provide improved lubricating means for the roll journal bearings which enable an effective check to be made on the lubrication of each bearing and which allow rolls to be changed without interfering with the set up of the lubricant pipes.

The invention comprises one or more oil reservoirs at the top of each side frame with pipes leading to, but not connected with the bearing housings, each such housing having an inlet funnel into which one of the pipes discharges and an outlet pipe at the usual overflow level from which excess oil is discharged into a funnel (not connected to the bearing housing) at the top of a pipe which in turn discharges into a second reservoir or sump at the bottom of the side frame. The reservoir has an inspection window so that the discharge from each overflow pipe into the reservoir can be seen, the arrangement providing for visual examination of the flow into and from each bearing housing in addition to the flow from each bearing housing into the second reservoir.

638,838. *Henry Simon (Holdings), Ltd., Joseph Flawith Lockwood, and John Stephen Ball.*

Recent patents have been selected from the "Official Journal of Patents" and are published by permission of the Controller of H.M.S.O.

Trade Marks

TANJEE. — 684,196. Non-alcoholic essences (not being essential oils) for making beverages. **The Birmingham Chemical Company, Limited,** "Wiltell" Works, St. John Street, Lichfield, County of Stafford; Manufacturing Chemists.
WHITMALLOW.—684,589. Marshmallow (confectionery). **T. Whittick and Son, Limited,** 48, Cogan Street, Hull; Manufacturers and Merchants.
MELOGEL.—684,842. Jellies (for food) and preparations for making such jellies. **Parkinsons, Limited,** Curzon Street Drug Mill, Curzon Street, Burnley, Lancashire; Manufacturing Chemists.
HEYDAY.—684,853. Canned meats, bacon, dead poultry, and dead game. **Heywood and Son, Limited,** 1, London Bridge Street, London, S.E.1; Merchants.
JILL.—685,773. Dates. **Établissements F. Vinatie** (Société responsabilité limitée organised under the laws of France), 16, rue Barrau à Bordeaux (Gironde), France; Merchants.
BLOSSOM FRUIT.—686,033. Non-alcoholic fruit drinks and fruit preparations for making such drinks. **Blossom Fruits, Limited,** 55, Blossom Street, Manchester, 4; Manufacturers.
WHINMOOR.—687,049. Canned and bottled fruits and canned and bottled vegetables. **Whalebone House Caterers, Limited,** 24A, Whitefriars Street, London, E.C.4; Canners and Merchants.
LOVELY LUCY.—687,502. Fruits, vegetables, and meats, all being canned, bottled, preserved, and dried goods; and meat pastes. **A. Elmassian (United Kingdom), Limited,** 108, Park Street, London, W.1; Merchants.
MORNING BITE.—687,539. Preparations of sugar, glucose, fruit flavouring, and colouring for use in making beverages. **Quinnette, Limited,** 33, Rushworth Street, Blackfriars, London, S.E.1; Manufacturers.

Trade marks have been selected from the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

New Companies

Posner's Bakeries, Limited. (485954.) 99, Baker Street, W.1. Nom. cap.: £1,000 in £1 shares. Dirs.: S. Posner, 10, Lexton Gardens, Clapham, S.W.12; E. Posner, 3, Atkins Road, S.W.12.
Continental Foods (Leeds), Limited. (485964.) 203, Chapeltown Road, Leeds, 7. Nom. cap.: £3,000 in £1 shares. Dirs.: N. Ellis, 1, Chelwood Grove, Leeds, 8; Miss L. Ellis, Miss M. Ellis, and Miss B. Ellis, all of 66, Camp Road, Leeds, 7.
Prestone Cookers, Limited. (486020.) 9, Park Place, Cardiff. To carry on the business of manufacturers of and dealers in cooking stoves and cooking apparatus, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: to be appointed by subs. Subs.: I. Griffiths, 9, Park Place, Cardiff (acct.); J. A. Cava, 8, Pembroke Terrace, Cardiff (solr.).
Suddabys, Limited. (486024.) 29, Front Street, Arnold, Notts. To carry on the business of bakers and confectioners, etc. Nom. cap.: £6,000 in £1 shares. Permt. mang. dir.: A. N. Suddaby, 14, Dean Road, Thackerays Lane, Woodthorpe, Nottingham.
Wesleys Food Products, Limited. (486026.) 26, Edward Street, Blackpool. Nom. cap.: £2,000 in £1 shares. Dirs.: A. J. Holling, Belsfield, S. Promenade, Blackpool; C. C. Oliver, The Star Hotel, S. Promenade, Blackpool.
Astell Laboratory Service Company, Limited. (486031.) 172, Brownhill Road, S.E.6. To carry on the business of laboratory suppliers, suppliers of bacteriological culture media, glassware, and apparatus; to act as consultants for the food and allied industries, etc. Nom. cap.: £2,000 in £1 shares. Dir.: J. R. Cuttell, 20, Holly Lane, Banstead, Surrey.
J. W. Sutcliffe and Company (1950), Limited. (486083.) 12, Great Portland Street, W.1. To carry on the business of manufacturers of and dealers in bottles, carafes, carboys, demijohns, and fruit preserving and other jars, etc. Nom. cap.: £10,000 in £1 shares. Dirs.: T. C. Sutcliffe (mang. dir.), Constance T. Sutcliffe, and J. E. Sutcliffe, all of The Cottage, Aston, near Stevenage, Herts.; L. C. Cox, 265, Park West, W.2.
Self Service Equipment, Limited. (486098.) 83-87, Cross Street, Sale, Cheshire. To carry on the business of manufacturers of and dealers in metal and other shelves, shop, office, factory, and household fittings, etc. Nom. cap.: £2,000 in 1s. shares. Dirs.: W. Doherty (permt. mang. dir.) and Mrs. E. Doherty, 31, Harbord Road, Sale; R. Faulkner, 15, Swaylands Drive, Brooklands, Sale.
Dewis Bakeries, Limited. (486118.) 36 and 38, King Street, Bedworth. To take over the business of Dewis Bakeries carried on at Bedworth by Edward H. Grubb. Nom. cap.: £500 in £1 shares. Dirs.: E. H. Grubb and Mrs. L. N. Grubb, 50, Warwick Avenue, Coventry.
London Candy Company, Limited. (486472.) 5-5A, Mackintosh Lane, E.9. To carry on business of manufacturers of and dealers in chocolates and confectionery, etc. Nom. cap.: £600 in £1 shares. Dirs.: R. E. Cheek, 147, Sandringham Road, E.8; J. J. Grainger, 28, Ashcroft Road, E.8; C. R. Seaward, 18, Broadstone Road, Romford.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.

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